

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Godfrey & Howson's Rotary Puddling Furnace.

The production of iron and steel of a superior quality and at a cheap rate has become so much a necessity for the future requirements of the world, that the problem of machine puddling comes more than ever into prominence. It is true that the manufacture of Bessemer steel, which has grown into so large a trade, is independent of the puddling process, but it is now known that it is possible to make excellent steel by the Atwood and the Siemens-Martin process with a large proportion of the iron of inferior quality, but this involves some perfect puddling, and can be effected by used. In puddling, iron that is puddled from, as distinguished from steel, can be dispensed with for multitude of purposes where steel is not applicable. The ordinary puddling furnace, however, cannot hold its place much longer, and the solution of machine puddling is certainly not far distant.

Among the more recent inventions to this end is that of Messrs. Godfrey & Howson, which attacks the subject by a method which certainly presents original and distinctive features. It may properly be called the jet furnace, being constructed so as to obtain its heat from mixed jets of gas and air. As long ago as 1868 Mr. Howson commenced his experiments in the application of the blow-pipe to iron metallurgy. It became evident that there were many advantages in this mode of utilizing fuel, especially in respect of economy, cleanliness and absence of smoke, and the subject was again taken up in 1873, in conjunction with Mr. Godfrey, with a view to adapting it to a system of automatic puddling.

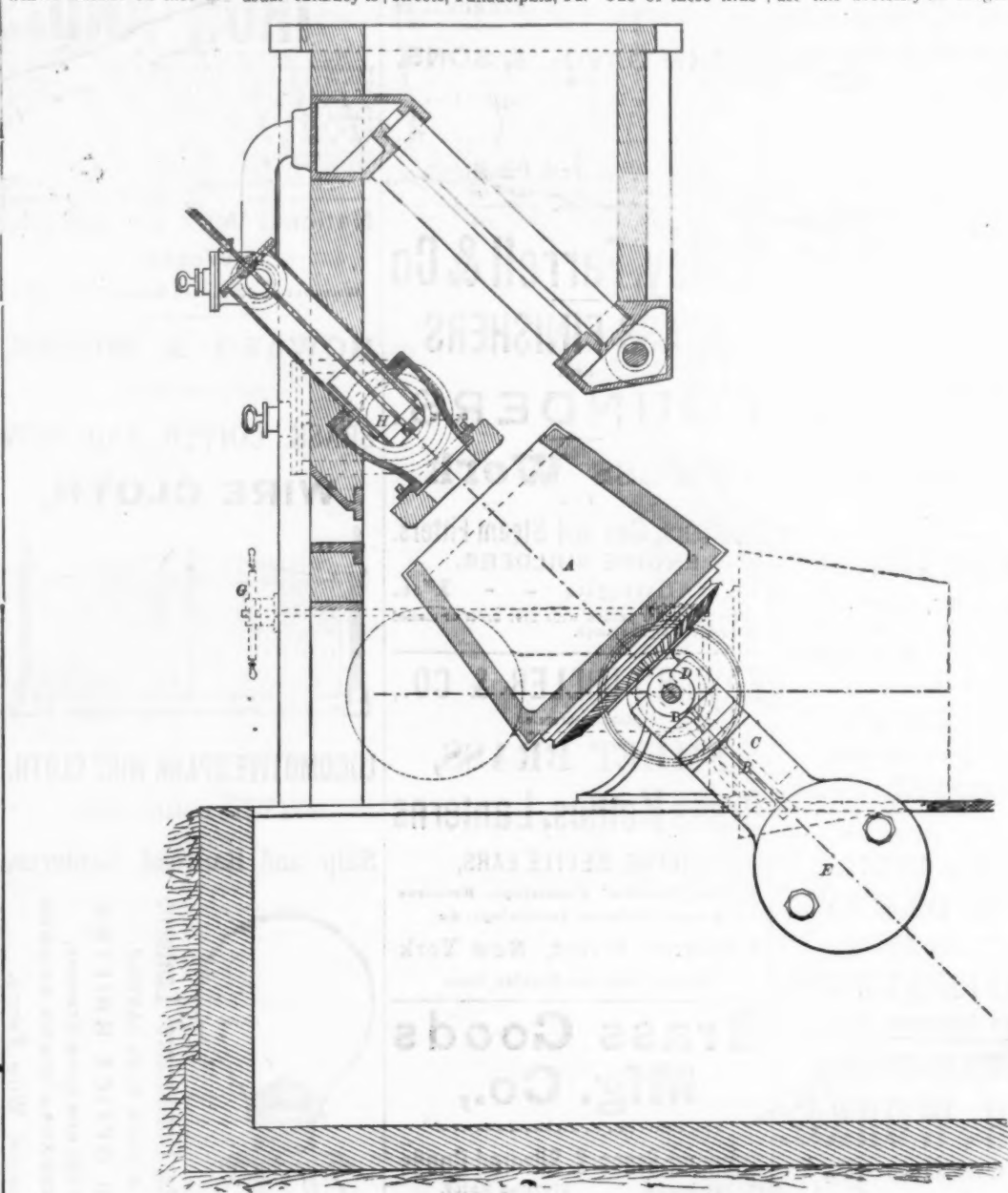
After devoting several months in trials of different forms of burner, and in maturing the mechanical arrangements, the conclusion was arrived at that a puddling furnace, in order to be perfectly successful, should possess the following properties:

1. There should be no attached fire place, but the heat producing arrangements should be independent.
2. The fuel consequently being gaseous, it should be made capable of being regulated to the exact volume required, and of being entirely shut off when not wanted. The same may be said also of the air needed for combustion.
3. In whatever manner the furnace is rotated, the ends should be entirely free from contact with rubbing surfaces. Adopting the principle of gas jet above alluded to, Messrs. Godfrey and Howson are enabled to fulfill these conditions with two modifications. The rotating chamber may either have two open ends or only one open end. In both cases, however, the action of the jets is precisely similar. When there are two open ends there are two sets of jets, viz., one to each opening, so that the jets meet in the middle of the chamber and impinge on one another. When there is only one open end the jets are caused to play over the bottom and the surface of the metal, but in both cases it will be observed that the products of combustion find their exit from the chamber, not in the same direction in which they enter, but recoil back in an opposite direction. We confine ourselves to a description of the latter construction, which, it will be seen, possesses several features of novelty. It is shown in the engraving in vertical cross-section.

A is the rotating chamber or receptacle for containing the metal under treatment. It consists of a simple wrought iron pan, lined with the usual oxide fettling, and it is mounted on a spindle B (shown in dotted lines) which is capable of rotation in a frame C, which frame again is mounted on a pair of trunnions D, and is furnished with a counterweight E, sufficient to balance the weight of the chamber. In a line with the trunnion is a shaft, which may be driven from any source of power, and on it is keyed a bevel pinion which drives a bevel wheel F, the latter being fixed to the revolving pan. On one end of the trunnion is also keyed a worm wheel in which a worm works, capable of being actuated by hand by means of a wheel G. It will thus be seen that while the pan is caused to revolve on its own axis, through the medium of the bevel gear, its position can be changed to any angle with the horizon by simply turning the hand wheel G. As shown in the figure, the angle is that which may be conveniently used during the operation of puddling, although this angle need not of necessity be strictly adhered to. When the operation is complete, the pan can be tilted over into the position shown in dotted lines for the purpose of taking out the ball. The jet apparatus, or what may be called the burner H, consisting of an outer duct for conveying gas, and an inner nozzle or a system of nozzles, constituting the air blow-pipe, is presented in front of the opening to the chamber when in its working

position. The direction taken by the entering flame, and the issuing products of combustion, will be seen from the drawings, and the mouth of the furnace, as will be observed, is perfectly free from frictional contact with either the source of heat or the exit of the gases. It will be understood that the usual chimney is

not necessary, although something resembling a chimney may be applied. In the illustration it assumes the form of a broad hood, which protects the workmen from the issuing gases, and across the interior of this hood is shown a range of pipes through which the air is caused to pass on its way to the burner. By this means the waste heat of the ascending current is intercepted and absorbed.



GODFREY & HOWSON'S ROTARY PUDDLING FURNACE.

Among the various propositions made to the

Italian government is one by a society of Italian and foreign capitalists, to put a roof, composed of glass and sheet iron, over the whole of the ruined town of Pompeii. This is necessary on account of the constant decay which the frescoes and the walls are undergoing. All that the company ask is that the admission fee be increased, and that extra tax be given to them for a certain number of years.

greatly preferred by operators. This iron is double pointed, can be worked in this particular is a great advance over the old style of irons with flat ends, which were constructed to enable them to stand before

grates to heat. Stoves now being in general use this necessity no longer exists, and the

shape of a hydraulic press for forging iron. The machine is capable of exerting a force of 100 tons, and it is believed that the forgings produced by it will excel in quality those manufactured by steam hammers.

Locomotive at Sea.

Not long since the steamer Novelty was run ashore in New York Harbor near Fort Wadsworth. The steamer, which had been used as an excursion boat from Newark, New Jersey, during the summer, was on her way to Florida where she was to run upon the St. John's River. Before she was out of the harbor she was struck by a schooner, and an 8 foot hole knocked in her bow, making it necessary that she should be beached to prevent her from sinking. The vessel was built at Chester, Pa., in 1869, for a novelty, by Mr. Gould, an Eastern man. The following are her principal proportions: Length, 216 feet; breadth of beam, 24 feet, and depth of hold, 5 feet. She is built of iron, and has a 339 tons burden.

In some respects this was one of the most remarkable boats ever built. Her peculiarity was in her engines, which consisted of two pairs of what are called marine engines, of 16 inch cylinder and 24 inch stroke, and two locomotive boilers 18 feet long and 54 inches in diameter. The idea was to use a light, fast running engine of the locomotive type, and so obtain great power with light weight and small boilers.

In railway practice it is found that an engine of 1000 horse-power is not much more bulky than the marine boiler of the same power. It has often been proposed to build a marine engine upon the plan of the locomotive, which should be not only light but powerful, and occupy very small space. To accomplish this, it is of course necessary that the engine be geared. Mr. Gould's idea was a good one, but unfortunately the vessel which he built was by no means fast; in fact, as a speedy boat, she was a failure. Other engineers had the same idea, and one in this city was making arrangements to build a steamer with engines upon this plan at the time the Novelty made her trial trip; her failure in speed was so great that the gentlemen for whom the boat was to be built wished the plan altered. The difficulty was not, however, in the plan but its execution. To obtain the power from such small engines it is necessary that they should run very fast. It is said that the paddle wheels and gearing of the Novelty were not properly proportioned for the peculiar service, and "locked up" the engines, i. e., made them run too slow, hence a lack of power and loss of speed. Judging from appearances the hull also was not of a very good model. Probably at some future time, when this failure is forgotten, another experiment may be made in the same line, and if the calculations are correctly made a fast, light and economical boat will be the result.

Steamboating Forty-two Years Ago.

An official list of steamboats on the Western waters on the 1st of January, 1834, gives the whole number at 234, whose aggregate amount of tonnage is equal to 39,000 tons—an average of about 166 tons to the boat. Their estimated cost was \$3,000,000, an average slightly below \$13,000 per boat. The annual expense of running them was \$4,500,000, or about \$30,000 each. During the years 1831, 1832 and 1833, 66 boats went out of service, equal to 23 per annum, or nearly 10 per cent. Of these 15 were abandoned as unfit for service; 7 were lost by ice; 15 were burned; 24 snagged; and 5 were destroyed by collisions, making 51 lost by accidents. The report goes on to say that the investments in steamboats are decidedly unprofitable; that the business is overdone, and that although steamboats are of incalculable advantage to the valleys of the Mississippi, they are too often the ruin of their owners. In all the 42 years that have transpired since the publication of that report, excepting a portion of the time during the war, we have had the same complaints as to the unprofitableness of steamboating, and yet we believe it capable of demonstration that, while admitting that many have been ruined by boating, no other business in this country has been more uniformly profitable. Many of our wealthiest men laid the foundations of their fortunes by steamboating. The rapid development of this great central valley will not only increase the demand for steamboats, but will make the business more profitable.—Cincinnati Commercial.

The chief signal officer in his annual report states that during the last fiscal year over 88 per cent. of his "probabilities" of the weather were verified. He thinks that an average of 90 per cent. is attainable. Owing to lack of appropriations the receipt of signals from the West Indies has been suspended. There are 145 signal stations maintained in the United States



Fig. 1.



Fig. 2.

IMPROVEMENT IN SADDLE IRONS BY THE ENTERPRISE MANUFACTURING CO., PHILADELPHIA.

shaped so as to fit the hand naturally. The iron is intended to heat quickly and retain its heat a long time, and to accomplish these objects is filled with a non-conducting fire cement. This iron is ground by patented machinery, and in addition to securing a very perfect finish the machine leaves the face of the iron slightly higher than the sides. This is an object which has long been desired by manufacturers, and irons made in this manner are

sides, and is a very desirable article for laundry and other purposes. The Star iron is in three different sizes, No. 1 weighs 5 pounds, one end rounded for polishing or light work; No. 2 weighs 6 pounds, for general use, and No. 3, 7 pounds for heavy work. The weight of the Gem is about 4½ pounds.

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SEE PAGE 9.

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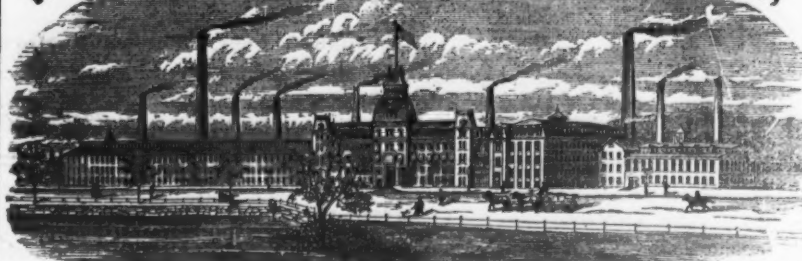
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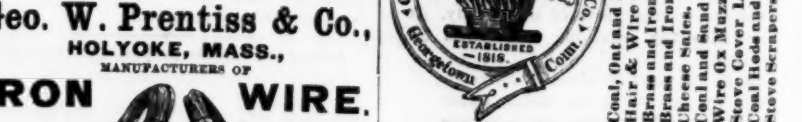
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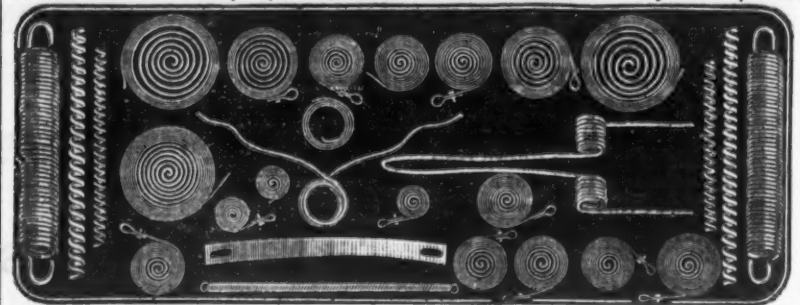
In offering this machine to the public, we would state that no fear need be entertained as to its durability, great care having been taken in the manufacture. The wood used is of the best quality of matched pine, and made in such manner as to prevent any dust from escaping when the sieve is being worked. The cog-wheel Ash-Sifter should be used by all having the care of Boilers, Furnaces, &c., and are likely to supplant all others. We claim it will do the work of any five machines now in use. It is always ready; can be worked backward and forward. Ashes to be sifted are placed in the Hopper on top of the Sieve, which we will designate as A. The weight of the ashes opens a trap door under the Hopper and enters the Sieve, which is suspended on an angle by double-joint d hooks. X is a large cog-wheel fastened on the side of Sifter, and connects with one one-fourth its size, which is revolved on a crank shaft, and connects an arm with the Sieve. B, Ash-box door; C, Ash-box; D, partition that separates the coal from the ashes; E, the coal-bin door; G, coal-bin. L is the opening where the coal slides into the bin while being sifted; F, door on top to take out clinkers, &c. With one revolution of the cog-wheel K, we get from ten to fourteen motions of the Sieve. We make three sizes: No. 1, three and a half feet long, two feet six inches high, and twenty inches wide, price, \$25; No. 2, four feet long, thirty-three inches high, and two feet wide, price, \$30; No. 3, four and a half feet long, three feet high, and two feet wide, hopper to hold one-half barrel, sifting it in less than one minute, price, \$35.

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AN OXYGEN BLAST.

By this process oxygen is imparted to the blast simply by its passage, on its way to the place of combustion, through a chamber or vessel holding an oxygen compound, from which, by the agitation of the air thereon, oxygen is set free and thus imparted to the blast. The required volume of this blast is one-half less. The combustion becomes perfect therefrom, all the carbon in the fuel being converted into a high and concentrated heat, without smoke or gas, and that of carbonic acid, being formed. Beside a saving of fuel, obtainable in all cases by this blast, advantages arise from it varying according to the appliance of the heat.

On Forge Fires it gives a clean and intense heat, free from all sulphurous gas, whereby a better and quicker welding is had and time saved. On fires under boilers for making steam, the saving in fuel is 25 per cent. and over, the working capacity can be increased in same ratio by reason of the intensified and accelerated combustion, which latter also overcomes the disadvantages connected with the use of fine dust and impure coal. Castings from a crucible in which the fire is sustained by this blast become of superior quality, uniformly soft to work and very tough, resembling wrought iron and steel; they forge hot and cold to some extent; the iron becomes strengthened and purified, being freed from carbon and sulphur. For blast furnaces this process becomes of vast importance—it saves fuel, increases the working capacity, perfects and reduces the cost of the metal, makes sulphurous and other impure ores fit for use. The serious drawbacks arising from imperfect combustion, caused mainly by otherwise uncontrollable atmospheric influences, are overcome. The work of a puddling furnace and that of decarbonizing the iron, both for wrought iron and steel purposes generally, is much simplified, shortened and perfected as to purity of product; the work of so many hours is reduced to as many minutes by this process. The process has the merit of being simple and easily applied, and with but very little expense, and this only for the needed chamber or vessel and its connection with the blast pipe; the vessel may be a wooden keg, barrel or larger cask or tank, properly lined, from two gallons for a single forge fire up to 500 gallons and over, according to the blast in use. The cost of the oxygen is conditioned by, and made subject to, its effect—it is but a small item compared to the gains from it. Although this process has been in practical use for over a year, the inventor felt reluctant to offer it to the public before having its utility and practicability fully established, beyond any and all contingencies, not from a theoretical standpoint, but from the testimony of manufacturers who have used the process this last year, and whose standing and reputation as manufacturers are of the highest order, and such as to entitle them to the consideration of others. For further information, and for small specimens of castings from this process, address

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Hygienic Pumping.

The Philadelphia Bulletin publishes the following, which is interesting:

They are in the midst of a big lawsuit in a neighboring village between Dr. Smiler and the rest of the population of the town. The doctor, it seems, had a large tank placed on the top of his house, from which to supply his bathroom, and so forth, with water. The water had to be pumped up about 50 feet from the cistern in the yard, and the doctor found it to be a pretty good sized job, which would cause him constant expense. So, after thinking the matter over carefully, one day, an idea struck him. He built a room over the cistern and put the word "Sanitarium" over the door. Then he concealed the pump machinery beneath the floor, and he rigged up a kind of complicated apparatus with handles and hinges and a crank, so that a man by standing in the middle of the machine and pulling the handle up and down, would operate that pump.

Then the doctor got out circulars and published advertisements about "Smiler's Patent Health Lift," and he secured testimonials from 1000 or so people, who agreed that the health lift was the only hope for the physical salvation of the human race. Pretty soon people began to call to see about it, and Smiler would rush them out to the "sanitarium" and set them to jerking the handles. And when a customer had pumped up 50 gallons or so Smiler would charge him a quarter and tell him that three months of that kind of thing would give him muscles like a prize fighter.

And he would push the project among his patients. If a man was bilious or had the tooth-ache, or was afflicted with rheumatism or croup or measles or yellow fever or cholera morbus, Smiler would turn him in at the health lift and get a quarter each time. The thing became so popular that he had to enlarge his tank and put in a smaller pump, and he not only got all his pumping done for nothing, but the people who did it paid him about \$1500 a year for the privilege. It began to look like an uncommonly soft thing, and everybody was contented and happy.

One day, however, old Mr. Maginnis, who had been practicing at the health lift every day for months in order to cure himself of indigestion, jammed the handles down a little too hard, and broke the board upon which he was standing. As the board gave way it plunged Mr. Maginnis into the cistern, and just as he was sinking for the third time Smiler fished him out with a crooked nail in the end of a clothes prop. As soon as the water was drained out of him, Maginnis said:

"I didn't know you had a cistern under that floor. What did you do that for?"

"Why, to keep the air moist. It's healthier than dry air."

"It looked to me as if there was some kind of a pump under there."

"Oh no," said Smiler, "those are only the levers of the lift."

"Mighty queer," said Maginnis, thoughtfully. "If that isn't a pump, then I don't know one when I see it."

So a few days later Maginnis came around, with a lot of other patients, and found the doctor out. They determined to investigate. They pulled up a couple of boards and ascertained the facts about that pump. Then they cross-examined Smiler's servant girl, and learned about the truth, and they went home mad. A consultation was held, at which every bilious and rheumatic individual who had been working the doctor's pump used violent language, and talked about murder and sudden death. Finally they resolved to prosecute Smiler for damages and for obtaining money under false pretenses. It is thought by good judges that by the time the case comes through with Smiler that will be about the unhealthiest lift for him he was ever interested in.

Encouragement for Intelligent Mechanics.

The Company of Needlemakers, says *Ryland's*, having determined to offer prizes by way of encouraging and developing the art of needlemaking in the neighborhood of Redditch, in which locality this manufacture has been established for many years past, the court of the company appointed a special committee to arrange a scheme for that purpose. A committee of manufacturers was selected from the manufacturing district, and the various details of the prize scheme were considered by it. The scheme of prizes sought to develop the art of needlemaking under three heads, for which prizes were offered: first, to encourage the introduction of labor-saving machines; secondly, to reward skill in handicraft, and lastly, to stimulate the inventive and reflective talent of the needlemaking locality in the neighborhood of Redditch by means of prizes for essays in connection with the needle manufacture. With reference to labor-saving machines, none were submitted for competition; the conditions stated that they must have been originated since the first of January, 1875, and although a great deal of machinery has of late years been introduced with success into the manufacture, only one machine is known that would come within that stringent condition, and this was not entered. In the section, "Improvement in any of the processes of sewing needle manufacture," four inventions were sent in. The judges awarded the first prize to Benjamin Hill, needle hardener, of Studley, for a pair of foot shears; and a second prize, consisting of £1, from local sources, with a certificate of merit, to Richard Bennett, junior foreman, of Redditch, for a "double polishing buff." Section No. 2, prizes for handicraft (tool making), produced, as might have been expected, the greatest number of competitors and the keenest competition. The prizes in this section were offered for the best specimens of

tool and work for sewing needles and sewing machine needles. In this section the judges awarded the principal prize to Charles Townsend, tool maker, Redditch. For sewing machine needle tools the judges awarded the first prize to John Warner, of Redditch. The prize for the best essay was not awarded; a second prize for an essay was given to W. Shrimpton.

We are decidedly of the opinion that a like effect to encourage progress in any of the leading manufacturing industries of the United States would be attended with great benefit. The intrinsic value of the prizes need not be great, but the honor of winning them would stimulate intelligent mechanics to master manfully the theory of their trades, and give substantial encouragement to inventive talent by securing immediate recognition for anything both novel and useful. The best way to educate the working classes is to encourage them to educate themselves.

A Nice City to Live In.—The gas pipe and sewer arrangements of Constantinople and its suburbs are such that its "occupation" would be attended by risks of a kind which no army belonging to a respectable nation could be reasonably called upon to encounter. A house in Pera was inhabited by an old lady, her two sons and a daughter and two young women, relatives of the family. A disagreeable smell was observed in the dwelling at about 7 o'clock in the evening, but it was thought to proceed from a can of petroleum, which was accordingly removed from the kitchen to the roof. Still the smell "went on," and the inmates of the house, being unable to account for it, retired to rest in spite of it. Early the next morning one of the sons, a boy of fourteen, proceeded toward his mother's room, but was seized with a fit of giddiness and fell on the stairs with a cry. This awakened the other dwellers in the house, who in like manner were stupefied by the atmosphere, but managed to raise an alarm. The neighbors hurried in, and a terrible spectacle presented itself to their eyes as they threw open the windows. All the inmates were more or less in a state of stupefaction, and, although removed at once to other houses, narrowly escaped with their lives, with the exception of the old lady, who was too far gone to be restored, and died shortly after removal. The catastrophe was caused by the defective state of the main gas pipe passing through the street, from which the gas escaped into the sewer. Owing to the sewer being in an equally defective condition, the gas penetrated the house, and hence the lamentable results. The case has not unnaturally excited some anxiety, not only in the neighborhood, but throughout the whole city.

Trade-Marks.—Those contemplating the registration of trade-marks under the new law, should observe the following general rules: 1st. A trade-mark must be new in relation to the class of goods to which it is applied. 2d. It must indicate origin of ownership, but must not be descriptive. By this is meant that a valid trade-mark cannot consist of words which the public at large would naturally use in describing the article to which it is applied. If this were allowed, the public might in time be so restricted in the use of words as to need a new language. 3d. It must not be connected with any fraud or deception practiced upon the public; as, for instance, with an article advertised to be a medicine, when it consists only of soap and water, or bottles purporting to hold quarts or pints, when in reality they hold less. 4th. A person's name is not a good trade-mark. This will not be registered, and will not be protected by courts when unaccompanied by some mark sufficient to distinguish it from a similar name belonging to another person who uses it in good faith upon similar goods. A fac-simile of a person's signature, however, has been held to be a valid trade-mark. It is not desirable to adopt it, because as against another person of the same name only the difference in writing will distinguish the goods of one from those of the other. 5th. It has been held that a geographical name cannot be sustained as a valid trade-mark, as other persons living in the place called by that name and using it in good faith cannot be restrained. It is not advisable to adopt such a trade-mark. 6th. A newly coined word or name, a device or word-name or mark, or picture, arbitrarily applied to a class of goods so as to have no descriptive meaning, has been held to be a good trade-mark.

The Perception of Color.—It is believed that the perception of color is an acquired faculty—a matter of education. Science gives us interesting details about what the human eye has been and what it may become. The Vedas of India, which are the most ancient written documents, attest that in times the most remote, but still recorded in history, only two colors were known, black and red. A very long time elapsed before the eye arrived at the perception of the color yellow, and a still longer time before green was distinguished, and it is remarkable that in the most ancient languages the terms which designated yellow sensibly passed to the signification of green. The Greeks had, according to the received opinion now, the perception of colors very well developed; and yet authors of a more recent date assure us that in the time of Alexander, Greek painters had for fundamental colors only white, black, red and yellow. The words to designate blue and violet are wanting to the Greeks in the most ancient times of their history; they called these colors gray and black. It is thus that the colors of the rainbow were only distinguished gradually, and the great Aristotle only knew four of them. It is a well known fact that when the colors of the prism are photographed, there remains outside the limit of the blue and violet in the spectrum a distinct impression which our eyes do not recognize as a color,

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BEST QUALITY.

Their location, coupled with every known im-
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enable them to offer Rails, when quality is con-
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The long experience of the present Managers,
of the Company, and the available reputation
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are deemed a sufficient guarantee that purchasers can,
at all times depend upon receiving rails unsurpassed
for strength and wear by any others of American or
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curved to template, largely used in the construction of Iron Vessels.

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For Top and Bottom Chords of Bridges.

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REFINED BAR, SHAFTING, and every variety of SHAPE IRON made to Order.

Plans and Specifications furnished. Address,

SAMUEL J. REEVES, President.

Office of the **ESSEX FURNACE**, JERSEY CITY, August, 1876.
We hereby certify that Col. H. R. Foote has reduced and removed a salamander from the hearth of
this Furnace weighing over 36,000 lbs., in less than 48 hours, without removing the hearth or injuring
the stack, or shoveling out the stock. That his method is an entire success and worthy of the confidence
and patronage of all furnace men.

FOOTE & McNULTY, Engineers and Contractors

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Construction, Remodeling and Repairing of Blast Furnaces,

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WITHOUT REMOVING THE HEARTH OR INJURING THE STACK,

with promptness and upon reasonable terms.

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mence operations without delay.**

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be accomplished; but the entire removal of the lump, even after it may have become cold, can be effected
by our process very much quicker and cheaper than by blasting.

Yours, respectfully,
FOOTE & McNULTY.

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Post Chains, Breast Chains, Hold-Backs, etc. sold by
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Send for illustrated circular and price list. Address

HOLD BACK SNAP CO.,

Sole Manufacturers, Troy, N. Y.

Silver & Deming's Feed Cutter and Safety Fly-Wheel.

The illustrations accompanying this article
represent an improved feed cutter and an im-
proved safety fly-wheel, by the Silver & Deming
Manufacturing Company, of Salem, Ohio. The
feed cutter, Fig. 1, has a number of points of
great excellence. An extended vertical move-
ment of the adjustable feed roller is attained
without materially affecting the mesh of the
gear wheel, thus securing the machine from
strains or breakage that would otherwise be
caused by over feeding. By a compact and
efficient device the adjustable feed roller is
maintained parallel with the other one, and its
gear wheel on the same vertical plane as the
gear wheel with which it engages.

The length of the cut is quickly and easily
changed without the use of detached gear
wheels, which when used are liable to be lost
or run through the machine. The gearing is

provide for testing a piece of wire sixty feet
long from the end of one ring in every forty,
of six feet of wire from the end of one ring in
five, of sixteen inches from the end of each
ring, and of one foot by a bending test from
the end of each ring furnished. The "rings"
of wire weigh about sixty pounds each. If
these end pieces pass inspection the whole ring
passes inspection. The only uncertainty, there-
fore, arises out of the possibility that the end
of the ring may be good while the rest, or some
part of it, may be defective. The risk thus
accepted is not great when the makers of the
wire are skillful and experienced, and engineers
do not hesitate to accept this method of test
as the best practically available, but no good
engineer neglects to take every precaution to
secure such uniformity in stock and in method
of manufacture, as well as in quality, as is de-
termined by the specified tests.

IRREGULARITIES UNAVOIDABLE.
A certain irregularity of quality is unavoid-

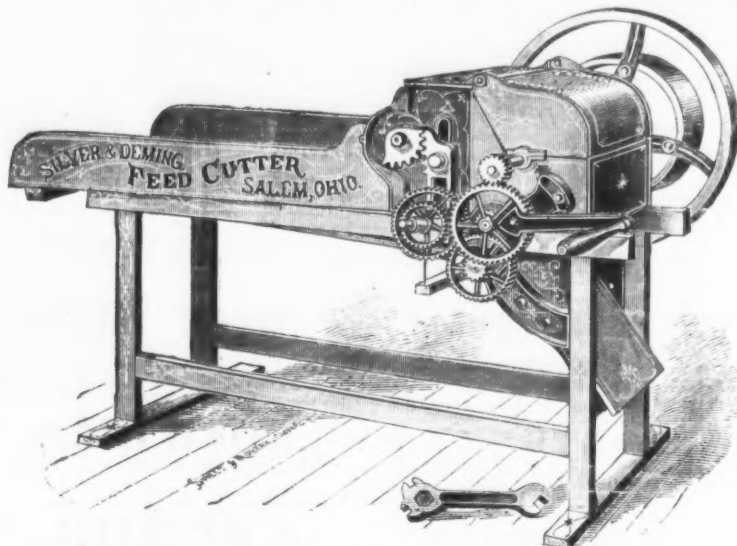


Fig. 1.

arranged so that no very small pinions are used.
The safety fly-wheel is an invention deserving
no little attention. The wheel is fixed on the
shaft by means of a friction cone, so that when
the cutters meet with any unusual resistance,
or are suddenly stopped, the fly-wheel can con-
tinue its motion without endangering the ma-
chinery. In attaching the fly-wheel to the shaft
the nuts B B B, Fig. 2, are tightened just suffi-



Fig. 2.

cient to prevent the wheel from turning on its
disk when doing its legitimate work; by this
means perfect safety is secured. The safety
fly-wheel can be attached to any of the feed
cutters made by the firm, except the pony cut-
ters, including the machines made and sold last
year.

The East River Bridge Wires.

Prof. R. H. Thurston, in a letter under date
of December 26th, says:

The specifications for the wire to be furnished
under the contract about to be made are, in my
opinion, simply admirable. They are confessedly
exact, and although probably certain
to give the successful bidder some trouble and
considerable annoyance, they will as certainly
secure the use of good material and the safety
of the largest structure of its class ever de-
signed. Assuming arithmetical accuracy in its
details, and that the responsible engineer will
be able to remove apparent inconsistencies
affecting to a certain extent the position of the
line to be drawn between metal to be accepted
and metal to be rejected, I have never seen its
equal, and consider it to constitute a long
first step in the direction of improvement. It,
therefore, is of importance, and has interest
alike to members of the engineering profes-
sion and to that public which is benefited so
greatly by every advance in the arts subsidiary
to that profession as well as by the success of
every great public work like the one referred to.
Specifications of such stringent character
and so minute in detail tend to create valuable
improvements in methods of manufacture and
in details of work which have permanent
value and which are of advantage to the world
in a thousand ways.

HOW FAILURE MAY ARISE.

The only liability to failure under speci-
fications of this class will arise from a certain
possible irregularity of product, which may be a
consequence of peculiarities in method of man-
ufacture, which no specification can wholly
provide against, or from variations in quality
of stock used in manufacture, which are equally
beyond the range of specification. Even here,
however, these specifications cover the case,
so far as it can be covered by the proviso—para-
graph 6—that the inspector shall have opportu-
nity to satisfy himself that the wire is all
made of suitable steel prepared from uniform
stock.

The specifications—paragraphs 10 and 11—

able, as is shown by the fact developed in these
very tests—of which the records are under my
hand—of wire offered the Bridge company by
bidders, in which the average of a small num-
ber of tests is usually far better than that of a
larger number of tests of the same wire, vary-
ing from nearly 4000 pounds for a half dozen
tests to 3600 pounds for wire subjected to
double that number of tests. A defect may
thus occur, or the quality may be bad, in any
one place, and remain undiscovered if the de-
fect or the low quality does not happen to ex-
ist in the end piece tested. This risk of passing
low quality wire is greater with some methods
of manufacture than with others, and is least
where uniformly good stock is used. The
latter requisite is readily secured, and the en-
gineer then needs simply to study methods of
manufacture to make the risk the least possible.

STEEL PROCESSES.

Steel is made by several processes; but by
far the greatest part of the steel in our markets
is made by either that known as the crucible
process or by the Bessemer process. A third
method, known as the Siemens, or the Siemens-
Martin process, is coming into use in this coun-
try, and is well known in Europe, and especially
in Great Britain, where its distinguished in-
ventor, Mr. C. W. Siemens, first introduced it.
Of these processes the crucible process has
formerly been a distinctively tool steel process;
the Bessemer process has produced only the
very "low" steel, such as is used for rails, and
the Siemens process has been exceptionally
valuable in working up scrap metal, both steel
and iron, and has usually also produced "low"
steel. The steel required by the builders of
the East River Bridge can be made by either
method. In the Bessemer process cast iron,
carefully chosen for purity and richness in silic-
on and carbon, is melted and poured into a
vessel called a "converter" in quantities of
usually about 5 tons to a "charge," and air is
forced through the molten mass until the silic-
on and carbon have been burned out, and
there remains almost pure wrought iron. Suf-
ficient carbon is then added to make of it the
required grade of steel. Finally the molten steel
is poured into ingot molds large enough to
contain several hundred pounds weight each of
metal, and when solidified it is rolled into
"wire rods" and drawn out into wire. The
rings of wire weigh about sixty pounds, and
each ingot makes several rings, of which one is
from the top, one from the bottom and the
others from intermediate parts of the ingot.
In the Siemens process several tons of cast iron
are melted on the "hearth" of a reverberating
furnace, and the carbon removed partly by the
oxidizing action of the flame and partly by
dilution with scrap or other wrought iron.
Samples are taken out now and then, and the
metal is tapped off into ingots when inspection
shows the proper grade to have been obtained.
The ingots are similar to those just described,
and are similarly treated.

In the crucible process, as formerly exclu-
sively practiced, selected "blister steel," of
which the quality was absolutely certainly
known, was melted down in crucibles and cast
into comparatively small ingots, weighing 70 to
100 pounds each. These ingots were broken,
inspected and assorted into lots, in each of
which all the steel was adapted to a specific
class of work.

By a later method wrought iron is melted in
the crucible in presence of the necessary quan-
tity of carbon, manganese and flux, and the
steel thus obtained treated as before.

BESSEMER UNCERTAINTIES.

Some uncertainty as to quality of product
exists in the Bessemer process in consequence

of the difficulty met with in adjusting the pro-
portions of carbon and manganese with pre-
cision in "re-carbonizing" and in consequence
of the difficulty of sampling accurately where
such large masses are handled. The skill ac-
quired by makers of this steel is, however,
very remarkable, and a mistake rarely occurs
in making stock for the purposes for which the
metal is most used.

The Siemens-Martin process is less well fitted
to produce large quantities of metal, but the
opportunities offered for test while the steel
still lies molten in the furnace and for correct-
ing any defect in grade adapts it to uses for
which Bessemer metal can only be obtained by
unusual skill in manufacture or in selection.
The makers of crucible steel have very great
advantages in being able to select their stock
with certainty as to quality, in ability to secure
almost absolute uniformity in mixture, and in
dealing with such small ingots that the quality
of the mass is indexed accurately by that of
the surfaces of the fracture when the ingot is
"topped" for sampling. The skill of old
makers of crucible steel in selecting and grad-
ing the metal is simply wonderful. They de-
tect at a glance differences of composition
which the most careful study by the unprac-
ticed eye would not lead others to suspect.

CRUCIBLE STEEL ADVANTAGES.

On the records of the Mechanical Laboratory
of the Stevens Institute of Technology are to
be found the results of the tests of 12 distinct
grades of crucible steel which differ by less
than one-tenth of one per cent. in proportion
of carbon, and which were selected by the eye,
and without a single mistake. The power of
selection thus indicated will be appreciated
when it is stated that the chemist cannot by the
best methods of analysis grade steel with equal
certainty and accuracy. Strain diagrams, pro-
duced by the autographic recording testing
machine of our laboratory, confirm this evi-
dence of the remarkable power of the trained
eye of the experienced steel maker. In select-
ing steel for any important work the engineer
usually prefers to use throughout metal made
of the same ores, the same stock, and by the
same process.

Either of the above described methods can be
made to satisfy the requirements of the speci-
fications. The only uncertainty as to quality,
above referred to, is probably least with crucible
steel, but need not be serious with the other
kinds under proper management and with care-
ful inspection. Other things being equal the
engineer would select the crucible steel which
best conformed to specification. If important
reasons should exist for placing two kinds of
metal in the same structure he might not hesi-
tate to do so, but he would take special care to
see the stock used in the several kinds and to
secure uniformity. He would be less likely to
object to using crucible steel of which the tests
were satisfactory, but of which he knew
nothing more, in a structure mainly composed
of other steels, than to using the latter under
similar circumstances in a structure mainly
composed of crucible metal. He would,
wherever possible, however, seek to secure
metal fully up to specification, and then to in-
sure absolute uniformity of quality by insist-
ing on the use of precisely the same stock, ex-
actly the same method of manufacture, and by
test, precisely the same quality of final product
throughout the structure, and especially in
those parts which, like the main cables of the
great bridge, are to sustain the immense strains
due to the weight of the whole suspended mass.
The quality of the metal used in the cables is
an essential, is the vital factor, in determining
the permanence of the structure and the com-
pleteness of one of the greatest of modern en-
gineering triumphs.

The Modern Fireside.

Miss L. C. Hardy contributes the following
very practical lyric of home life, which is not
without genuine humor, to *Scribner's Magazine*:

In the primitive days of our grandfathers' time,
When the fire-place, genial and bright,
Its cavernous recesses glowing with flame,
Filled the old-fashioned kitchen with light;
They used often to gather at close of the day,
Round the hearth-stone, that altar of yore,
But men of this modern and glorified age,
Collect round—a hole in the floor.

The grandfather sat in the chimney nook,
In an old-fashioned splint-bottomed chair,
And solemnly read from the blessed old Book,
Then knelt with the household in prayer;
Their altar the time-honored hearth-stone with gleams

Of the fire-light flickering o'er.
We moderns all worship 'neath fresco and gas,
Our altar—a hole in the floor.

When from the old hearth-stone the children
went forth

To join in the soul-thrilling strife
And win themselves laurels or valiantly brave—
The buffeting surges of life;
Then with world-wearied hearts yearning sadly
for rest,

They would seek the old hearth-stone once
more;

But we, when weary with toil and oppressed,
Return to—the hole in the floor.

When the tumult of war overshadowed our land
And our forefathers rushed to the fray,
To repel the invaders that threatened their
homes,

Leaving mothers and daughters to pray—
The thoughts of their hearth-stones gave
strength to their arms

And thrilled their brave hearts to the core,
But our heroes when called on their homes to
defend,

Must fight for—a hole in the floor.

Then let us rejoice that we live in an age
When instead of the hearth-stone's bright
glow,

Or the cavernous fire-place chime with flames,
We have "modern improvements," you
know,

And when we converse of those primitive times,
And the jolly old customs of yore,
We will laugh as we think of their old-fash-
ioned ways,

As we sit round—the hole in the floor.

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 For each additional constituent of usual occurrence..... 1.50
 For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.
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 For determining the constituents of a Clay, Slag, Coke, or of an Ash of Coal the charges will correspond with those for the constituents of an ore.
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 Prior instructions for obtaining proper average samples, or analysis furnished upon application.

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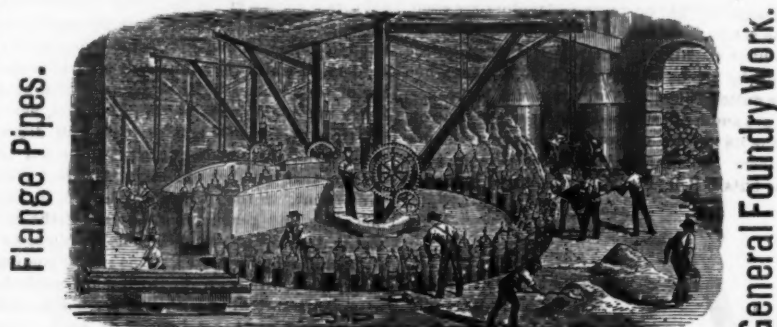
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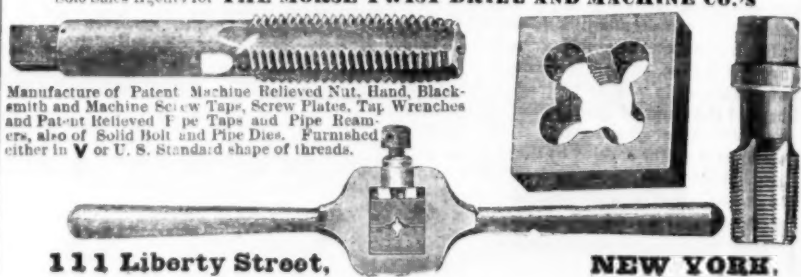
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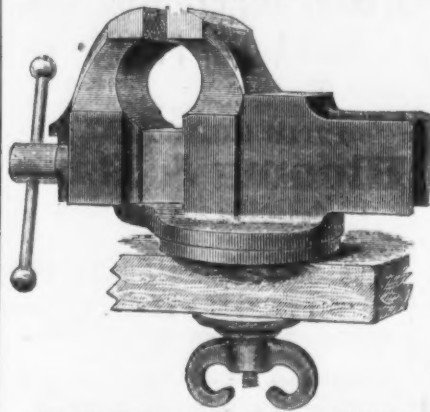


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The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. Silver Medal awarded at the Great Fair of American Institute last autumn. We make more than 30 styles.

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Will roast 30 to 40 lbs. at once, and can be used as a stove at other times.

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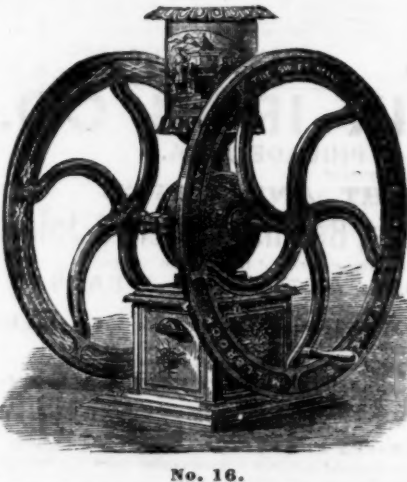
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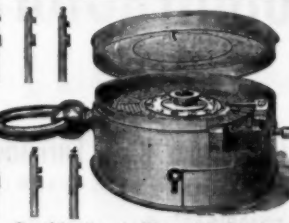
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Watchman's Time DETECTOR.

Important for all Large Corporations and Manufacturing Concerns.

Capable of controlling with the utmost accuracy the motion of a watchman or patrolman as the same reaches different stations of his beat. The instrument is complete in itself, portable and as reliable as the best lever watch. It requires no fixture or wire communicating from room to room, as is the case with the ordinary watch clocks. A small inexpensive stationary key is alone required at each station. The instrument will, in all cases, be warranted perfect and satisfactory.

CAUTION.—The public are notified that in my suit against Imhäuser & Co., of New York, a decree was made in my favor, June 10, 1874.

Proceedings have been commenced against said Imhäuser & Co., for selling clocks contrary to the order of the Court, and especially the clock with a series of springs in the cover and marked "Patented Oct. 20th, 1874." All persons discovered using these infringing clocks will be dealt with according to law.

J. E. BUERK, Proprietor,

P. O. Box 979.

No. 230 Washington Street, Boston.

In sending for circular or ordering the above, please mention this paper.

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MIDDLETOWN, CONN.

The Oldest and Most Extensive Manufacturers of

**PUMPS,
HYDRAULIC RAMS,
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Yard Hydrants, Street Washers.

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Hydraulic MachinesIN THE
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Awarded the GRAND MEDAL of PROGRESS at WORLDS' EXPOSITION, VIENNA, 1873, being the highest awards on Pumps, &c., also, highest medal at PARIS in 1867, and Philadelphia, 1876, accompanied by Report of Judges.

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LOOSE PIN REVERSIBLE,

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Japanned, Figured Enamelled, Nickel Plated
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This Hinge has two flat coil springs, very powerful. It has a heavy solid pintal, giving much less friction than a hollow pintal. It has broad, solid bearings in the knuckle, which do not wear down readily and let the door sag. It is Fast Joint, therefore can be used for either right or left hand. By actual test it has an average of 50 per cent. more power than other Spring Hinges in common use of same size.

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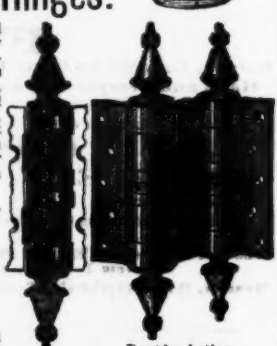
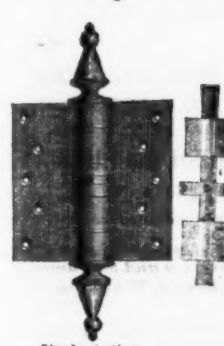
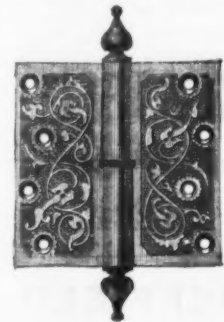
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Are Guaranteed Superior to all others.

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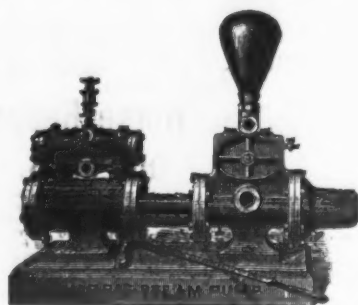
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Adapted to every Situation.

**THE
GREATEST EFFICIENCY**Coupled with the
Simplest Mechanism.OFFICE OF CROOK'S HOTEL,
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GENTS.—It affords me pleasure to state that the "Harris Steam Pump" furnished by you for my Hotel is fully up to your guarantee, and is a perfect success. It pumps water to the upper story of the Hotel, an elevation of eighty (80) feet, with a steam pressure of less than fifteen (15) pounds; it is perfectly noiseless in operation, and differs from any pump that has been used by me in the same situation, in that it does not "telegraph" on the pipes running through the Hotel, and on that account alone is invaluable.

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CRANE'S "76" POTATO MASHER.



The most efficient, durable and easily cleaned of any article for the purpose ever manufactured. Supplied to the trade only. Samples sent free to responsible houses. Agents wanted in every State. Send for illustrated circulars and price list to

ROBERT CRANE, JR.,

Columbia, Lancaster Co., Pa.

See The Iron Age, Dec. 14th, 1876.

A Deposit of Bismuth in Connecticut.

We have received from Mr. Ogden Haight, No. 65 Wall street, N. Y., some interesting specimens of the ore of bismuth, the first we have ever seen from an American mine. Deposits of bismuth of workable dimensions are somewhat rare. Our entire supply of this metal is derived from two sources, viz., mines in Saxony and Bolivia. The price is at present so high as to prevent its introduction in the arts to more than a limited extent, but a reduction in the price will bring into use many of the valuable alloys of this metal with lead and tin, to which it adds both hardness and fusibility, while its peculiar property of expansion upon cooling will render it of value for ornamental castings, to die sinkers, etc.

The specimens above noticed are from a valuable deposit of bismuth in its native state, found not far from Monroe, Fairfield county, Conn., in veins of quartz rock of considerable size, intercalated between walls of gneiss. One of these veins has been traced for a distance of three-quarters of a mile. It is from 10 to 15 feet wide, and holds probably from 15 to 20 lbs. of the metal to the ton. It runs in a nearly North and South line, lying about one mile east of the town. The other vein lies about one mile west of the town. It is similar in character, and runs also nearly North and South. Veins of argentiferous galena occur in this locality. Minerals of copper, schistite (tungstate of lime) and wolfram (tungstate of iron and manganese) are found in the quartz in large quantities. The western locality has already been developed to a slight extent. The specific gravity of bismuth being 9.83 while that of quartz is only 2.65, the bismuth can readily be extracted by suitable separating machinery and delivered ready for melting up. It contains a trace of gold. The cost of mining the ore is estimated at \$1.25 per ton. There is a valuable water-power at the eastern locality, which could be bought and put in order for \$1000. The requisite concentrating machinery would cost \$4000 more, so that with from \$5000 to \$10,000 the mine could be put into operation on a limited scale. Much time and money has been spent in getting the right of working these properties. They have been secured, however, and are now offered for sale.

Bismuth is a hard, brittle metal of a reddish white color, sp. gr. 9.83—melts at 507° F.; produced in two localities, Saxony and Bolivia. A combination exists between producers, the sales being controlled by English parties. The production in Saxony in 1871 was 32,000 pounds; present consumption in this country about 10 tons per annum; cost of importation, \$1.50, gold, per pound; used principally in the manufacture of alloys. One of bismuth, two of tin and one of lead forms soft solder; eight of bismuth, four of lead and two of tin—Wood's fusible alloy—melts at 150° F.; two of bismuth, one of lead and one of tin—die sinkers' alloy—melts at 200° F.; five of bismuth, three of lead and two of tin—stereotype metal—melts at 190° F.; twenty parts bismuth, eighty parts mercury, used for silvering interior of glass globes.

The alloys of bismuth with copper are brittle and of a pale red color, whatever the proportions employed. Those of bismuth with zinc give a more brittle metal with a larger crystallization than either of the two taken singly; hence useless. Those of bismuth and tin are capable of use. Bismuth adds hardness, sonority, luster and fusibility to the latter metal. Bismuth and lead alloy upon simple fusion give a product much more tenacious than lead. They are malleable and ductile as long as the proportion of bismuth does not exceed that of lead. An alloy of bismuth two and lead three is about ten times harder than pure lead. An alloy of equal parts of each is white, lustrous, sensibly harder than lead and more malleable. An alloy of bismuth one and lead two is very ductile and may be laminated into thin sheets without cracks; fuses at 166° C. Bismuth has the peculiar property of expanding upon cooling, like water when converted into ice. An alloy of antimony and bismuth makes a very delicate thermometer; measuring the one ten-thousandth part of a degree. Farmer's thermoelectric battery, for use in telegraph offices to replace the present form of batteries, is composed of alternate cylinders of bismuth and antimony.

The action of bismuth in alloys is to increase their hardness, fusibility and brittleness. When it can be obtained in abundance and at a less cost the alloys with tin and lead will become popular. The salts of bismuth are extensively used for medicinal and other purposes, the consumption for these purposes alone being in the neighborhood of three tons per annum in this country. Only two of them are commercially important, the trisulphate and the oxychloride. The former is known as "flake white," and is employed medicinally. The latter is known as "pearl white," and is extensively used for enamels on porcelain and in gilding. It is valuable in the manufacture of optical glass. Its principal use is, however, as a cosmetic. Flake white mixed with tin and tartar is used as a mordant for dyeing lilac and violet in calico printing.

Curing the Wrong Chimney.

There is in Troy, N. Y., an enterprising firm who are agents for a patent chimney top, which they warrant to be a certain specific for smoky chimneys, and also guarantee them to produce an irresistible draft to the most obdurate stove. They gave the most perfect satisfaction in every instance, until one was placed upon a chimney of the building in which Hyatt & Comstock's law office is located. The above firm being utterly unable to derive the requisite amount of heat from their renowned base burner stove, determined to test the merits of the invention of which they had heard so much, and accordingly gave directions to have one of the patent tops placed in position. The weather

being moderate at the time, little attention was paid to the matter, but when the cold snap came, and they attempted to get up an extra amount of fire, they failed to see any advantage from the so-called improvement. After resorting to every device until patience ceased to be a virtue, they dispatched a messenger in pursuit of the agent of the patent, with a request that the provoking thing be either put in working order, or removed forthwith. The agent completely nonplussed, repaired to the roof, and, after making a thorough examination, to convince himself that the top was properly adjusted, essayed to build a fire himself, confident that he would be able to demonstrate to the satisfaction of all the utility of the invention, but without success. After nearly half a day spent in fruitless effort, and when, all disheartened, he was about to pronounce his vaunted improvement a complete failure in this instance, one of the legal gentlemen interested, chanced to come down the street on the way to his office, when casting a glance at the chimney that was causing all the unpleasantness, he discovered that the improvement, instead of being placed thereon, had been adjusted on a chimney adjoining. This gratifying intelligence was conveyed to the discomfited agent, when the necessary removal was made, and the great worth of the patented article in the briefest possible time fully proven. Henceforth the agent proposes to fully ascertain upon whose chimney he is making improvements before he completes his work.

Fire-Proof Shingles.

A writer in the *Polytechnic Review*, says a gentleman in Philadelphia, has effected arrangements for practically introducing, upon a large scale, an extremely simple and excellent process for impregnating shingles with antiseptic and noncombustible substances, the immediate object of the process being to prevent the destruction of shingles by rot, and to render them proof against fire under ordinary contingencies. Concerning the great utility and value of a process of this kind, which will fulfill in practice the promises of its advocates, there can be no difference of opinion. Shingle roofs have always been extremely popular, as the enormous annual consumption of timber in their production indicates, but the advantages which they possess on the score of cheapness and excellence is materially affected by their liability to take fire at the slightest cause, and the rapidly with which they deteriorate, by decay or rot, under the influence of the weather.

The annual consumption of shingles in the United States at the present time has been estimated at about 4,000,000,000, of which, doubtless, not less than 75 per cent. are demanded to replace those destroyed by fire or rendered worthless by rot. It will therefore be apparent that these two elements of mortality entail upon the country at large an enormous annual loss in dollars and cents to say nothing of the losses arising from the communication of fire to neighboring buildings, which in many instances may be directly traced to the same cause.

The expedients that have heretofore been practiced to obviate or lessen these dangers and disadvantages consist mainly in the liberal employment of paints or whitewash, which, in addition to being expensive or troublesome, are only partially, or at best, temporarily effective. By the process which Mr. Smith employs, the shingles are submitted to the action of antiseptic and non-combustible chemicals until thorough saturation is effected. This treatment insures the effectual coagulation of whatever of the decomposable sap matters remain in the wood, and so completely impregnates the fibers with mineral matter, that their ignition from all ordinary causes of accidental fires, such as sparks from locomotives, flying cinders from burning buildings, etc., is rendered impossible. At the same time the texture of the shingles is rendered denser and harder. A burning chip of wood, or glowing coal, placed in contact with the surface of one of the prepared shingles will simply carbonize the wood, at the place of contact, but will not inflame it. As a preventive against fire, therefore, the process in question is obviously of great practical value. The removal or the conversion of any albuminous matters that may remain in the wood into insoluble compounds with the antiseptic chemicals employed, on the other hand, is an equally effectual and valuable preventive of rotting.

From the inventor's published statement, the cost of the prepared shingles will not prove to be an objection against their general introduction, but will, on the other hand, prove to be one of their strongest claims to public favor. At the present time the wood used for the better (because more lasting) qualities of shingles is cypress or cedar, and requires to be carefully selected and seasoned, and are sold at a much higher price per thousand than the commoner sorts made from spruce, hemlock or pine. The process of Mr. Smith permits of the use of hemlock, pine, spruce, cypress, poplar, or other common sorts of wood, and by virtue of the imperishable and fire-proof qualities which it imparts to them, renders these materials more durable and vastly safer than the more expensive materials usually employed. The actual cost of the treatment is admitted to be quite small, and the prepared shingles are available to the public at a price notably cheaper than they are at present charged for the better grades of ordinary shingles, the inventor's statement being to the effect that they can be sold at a cost of about one-third the price of good cedar shingles.

During the last twenty years the British government has added 573 ships to the navy by building, and has purchased 41 more. It has sold 110, broken up 125, and 81 have been lost. The number of Gatling guns in use is rapidly increasing. The large iron-clads are now all armed with them, and several have been sent to Malta for the Mediterranean fleet.

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The American File Company have the exclusive right to use the Bernot process for cutting files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth. They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works.

Price lists and information furnished on application.

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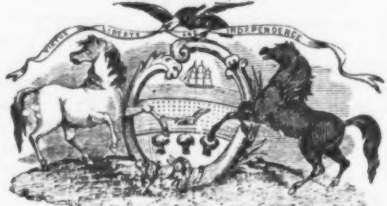
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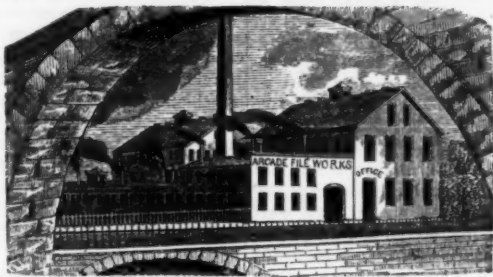
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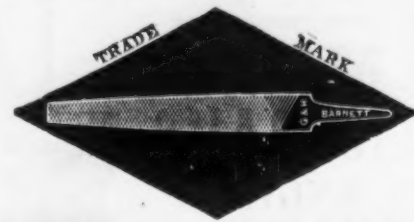
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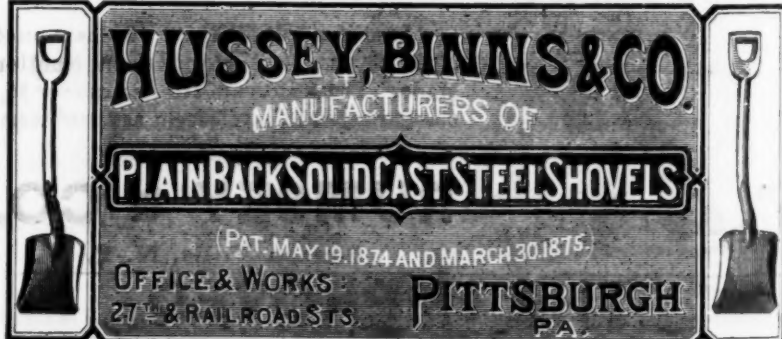
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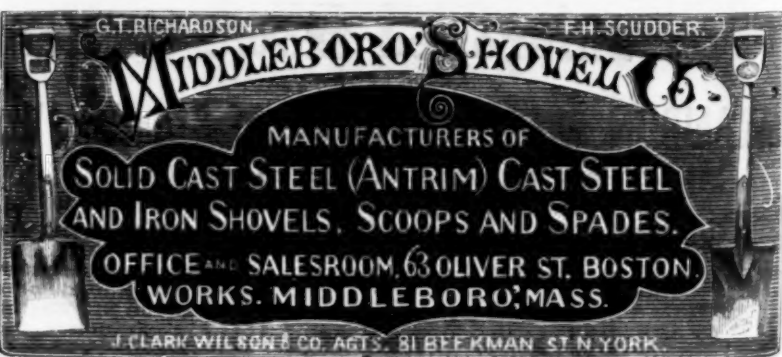
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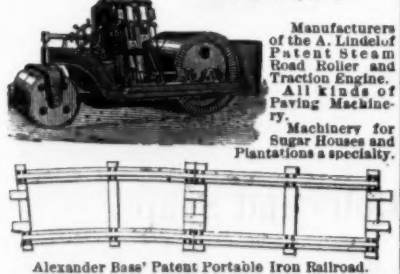
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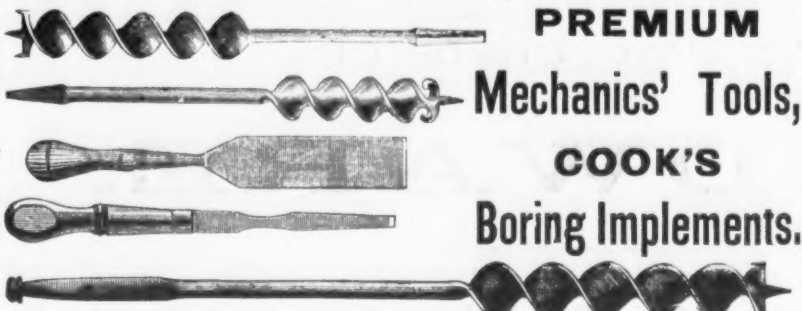
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is on every package. None other genuine.

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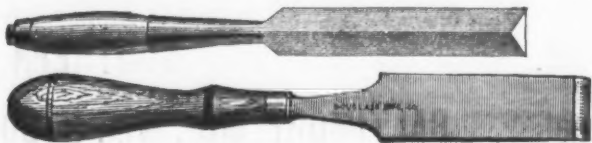
New York Warehouse, 62 Reade Street. P. O. Box 2610.

FACTORIES, Seymour, Conn.

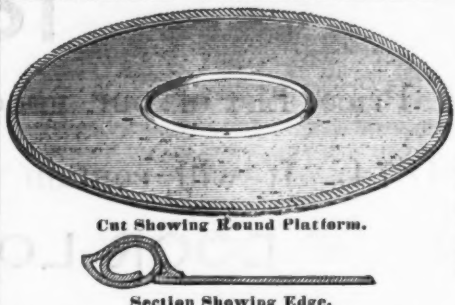
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**PREMIUM****Mechanics' Tools,****COOK'S****Boring Implements.**

Chisels, Gouges and Drawing Knives of all kinds, Screw Drivers,
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Bits, Wood and Metal Head Gimlets, Improved Hollow
Augers, Blake's Patent Extension Bits,
Boring Machines, Chisel Handles, Wood Boxes, Tool Chests.

**ANSONIA CORRUGATED STOVE PLATFORM**

Manufactured by the

Ansonia Brass & Copper Co.Office, 19 & 21 Cliff Street,
NEW YORK.

Cut Showing Round Platform.

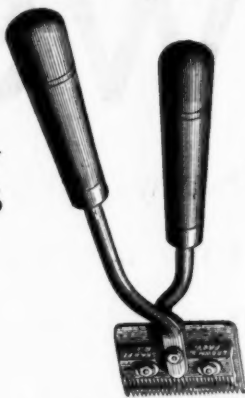
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The Ansonia Corrugated Stove Platform, with its heavy figured edge border, is believed to be the best Platform offered to the trade. As shown in the illustrated section herewith it requires no nailing to keep it in place or to prevent it from turning up at the edge; while the metal is of sufficient thickness to require no lining.

The low price, superior quality and fine finish of this Platform will be readily acknowledged. Packed 100 in a case.
Send for price list.

Horse Clipping Machines.

Price \$5.00.



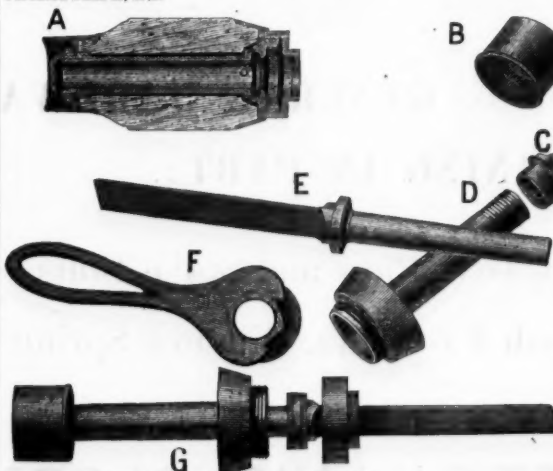
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Are carefully made, and are of such a quality and form as to work with smoothness, thus avoiding altogether the usual irritation attending the shearing of horses.

BROWN & SHARPE MFG. CO., Providence, R. I.**HENDRY'S PATENT CARRIAGE AXLE.**

Patented June 29, 1875.



Patented June 13, 1876

DESCRIPTION.

A. Section of hub complete, showing oil-chamber o.
B. Front band.
C. Nut which screws on to box D, and confines box D and band B to the hub.
D. Box and back band in one piece.
E. Axle.
F. Wrench in place on back nut.
G. Axle with back nut unscrewed from box, and both slipped from the collar, showing leather washer each side of collar, and iron band in place.

Points of Excellence.

No oil can come in contact with the wood of the hub to loosen the spokes, or otherwise injure the wheel.
No oil can escape to deface the wheel and spoil the varnish.
No dirt, gravel or water can work in upon the axle.
It holds the wheel in a superior manner. It is easier to oil than a common axle. It is adapted to any kind of a wheel. It requires no wedging to box the wheel.

It will run 500 to 1000 miles at a single oiling.
In ordering, give size of axle wanted, diameter of front band, and diameter of hub.

HENDRY'S PATENT THILL COUPLING SPRING.

Patented Oct. 3, 1876.

This useful invention meets a great want, and will be easily understood from the cut. The spring is made of Best Cast Steel Tempered, and is adapted to any coupling where rubbers are used. It is neat in appearance, prevents all rattling, is durable, and costs but a trifle. Call for it at your nearest hardware dealer, or we will send set by mail, postage paid, on receipt of 25c. Manufactured by
BRIGHAM, LITCHFIELD & VINING,
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Also Manufacturers of all kinds of
TACKS, BRADS, NAILS, &c.
All Tacks assorted by our new **PATENT ASSORTER**, which removes all dust and silvers and poor Tacks, so that the purchaser pays for nothing but perfect goods.
Warehouses, 97 Chambers & 81 Reade St., N. Y.

**The British Iron Trade of 1876.**

During the somewhat uneventful year just closed, the iron trade and allied industries of Great Britain have passed through a series of struggles and difficulties without parallel in former years. It may be admitted, perhaps, that the abnormal development which has taken place in all branches of the iron and steel trades since 1873 has been a principal cause of the dullness now witnessed, but it must also be conceded that the stagnation is worldwide. In every part of the civilized world these industries have been beset with difficulties and dangers—trials which have left our foreign manufacturing competitors quite as hard pressed as our own.

Dealing with home matters solely, however, we find that at the beginning of the year there were in Scotland 114 furnaces in blast, beside 10 which were being repaired, two in course of construction and 31 not working. On January 1st the Scotch makers held a total of 170,000 tons of pig iron in their respective yards, in addition to the 63,299 tons then in Messrs. Connal's warrant stores at Glasgow. The prices of No. 1 makers of the Scotch pig irons were as follows: G M B, 66; Gartsherrie, 75; Coltness, 79; Summerlee, 71; Calder, 76; Langloan, 75; Carnbroe, 67; Shotts, 74; Gleggarnock, 70; Eglinton, 65; Dalmellington, 65; Carron, 70; Kinnell, 66; and Almond, 66. Warrant quotations were 64 1/2, and the bank rates of interest three per cent. In the Cleveland district there were 159 furnaces built, of which total there were 114 blowing, six in course of erection and the remainder laid off. The makers of the district held a stock of 74,700 tons of pig, beside a small quantity in the warrant stores at Middlesbrough. It was also elicited about this time that the total production of pig iron in Cleveland during 1876 had been about 2,047,000 tons. North Country iron rails were sold at about 45s. 10d; plates at 48s; Bars at 47. 17/8, and angles at 47. 14/8 per ton.

In the Sheffield district the advent of the year was marked by a very dull state of affairs, the outlook being without encouraging feature. At some of the steel works wages were lowered, and it was only after an unusually long holiday period that the leading works relighted their fires. Local pig iron of the district firms was quoted 66/ to 67/ for foundry No. 1 qualities, and 62/6 to 64/ for No. 3. Hematite pigs were held at the following quotations, which should be borne in mind in view of the course of events during the year: Maryport hematite No. 3, 72/6; No. 4, 72/6; No. 5, M and W, 72/6; Maryport Bessemer No. 1, 80/; No. 2, 77/6; No. 3, 75/; Millom, ordinary, No. 3, 72/6; No. 4, 71/6; No. 5, 71/6; M and W, 80/, all per ton. The armor plate industry opened steadily, and has indeed remained moderately busy during the whole year. The steel trade was dull to begin with, and in saws and files the amount of business was anything but promising. Merchant iron was even more neglected, although the quotations of the local makers were low, the Midland Iron Company's bars being 29/ 10/; edge tool iron, 210/ 10/; best plating iron, 210/ 10/; hoops, 211/ 10/; and sheets, 214/ 10/. At Birmingham and in the whole of the iron district dominated by South Staffordshire, the iron trade began the new year with poor prospects, the ruling prices being these: Marked bars, 210; Earl Dudley's, 210. 12/6; unmarked bars, 28 to 28. 10/; sheets, 211 and upward, according to quality, 213 being estimated a fair price for marked sheets; hoops, 211. 10/; boiler plates, 211 to 212. 10/; river iron, 211. 10/; best best rivet iron, 213; T's, 210. 10/ to 212. 10/; plates, 212 to 214; Earl Dudley's common rounds, 210. 12/6; best, 212; best best, 213. 10/; treble best, 215; treble best strips, 217. 10/; Baldwin's charcoal, sheets, B, 233; E B, 235; native all mine cold-blast pig, 20, and hot blast, 24. 15/; all per ton. The Birmingham hardware manufacturers were not busy, although in some departments a few old orders remained in hand. In South Wales and Monmouthshire, 1876 appeared to be likely to bring about a better state of matters in the once great iron trade of that part of the country, the employers of the principality having then recently succeeded in settling a sliding scale as the basis of settlement for all future wages disputes. In the tin plate trade, too, there was believed to be an alteration for the better night at hand, ordinary coke plates being quoted 21/6 per box, and charcoal, 25/8.

This was the general condition of the iron trade in January, 1876, 1875 having ended stormily, as was indicated by the Board of Trade's returns (issued early in January), showing the total exports to have been of the value of £223,494,570, as compared with £239,555,117 for the twelve months ending Dec. 31, 1874. The home and colonial markets were the chief reliance of our producers, it being evident that in South America stocks were heavy, that Egypt and Russia could not afford to spend much money, and that Turkey and the Danubian principalities were not unlikely to become involved in war. India, too, was giving itself to festivities in connection with the Prince of Wales' visit, so that merchants were not by any means disposed to enter into large speculations.

The inner workings of the engineering concerns were threatened with disruption, in consequence of a threatened lockout to enforce the system of piecework—a threat never enforced. At the quarterly meetings of the ironmasters, held between January 10th and 14th, there was plenty of discussion, but no practical result, prices remaining without change, although on the date last mentioned Scotch pig iron grew brisker, warrants being quoted 65/6 to 66/6. In the early part of February Scotch pig relapsed a little, but in other parts of the country that material remained steady, partly in consequence of the probable strike of puddlers and others at Sheffield, who were served with notices intimating an intention to reduce their wages 10 per cent.—an intention subsequently abandoned by the employers. At Barrow, nevertheless, the steelworkers accepted a drop of 5 per cent., and the Welsh tinplate workers a reduction of 7 1/2 per cent.

About this time Swedish iron prices for delivery during the season were announced as follows: C B F railroads, squares and flats, 210; C railroads, &c., 215. 15/; C B F, rolled bars special prices; C B F, wire rods to 4 1/2 W G, 217; L L C wire rods, 217; "Bofors" rolled bars, 5 by 5 for steel purposes, 215. 7/6; C B F, hammered bars, 215. 7/6.

Pig iron now grew steadier, and in the Cleveland district was rather firmer in price, the monthly returns for that part of the country showing the make during January to have been 177,765 tons, of which 47,400 went by sea, leaving 130,365 tons on hand. In the middle of February Messrs. Baldwin reduced their tinplates by 2/ per box, making 1 C charcoal 31/; Wilden, 30/; Unicomb, 25/; Arley, 28/, and coke of unsorted qualities, 26/ at the works. Scotch pig iron also came down about eighteenpence per ton, and in Cleveland ship plates were lowered 5/ per ton, in the hope of thereby stimulating the demand. Wages, too, began to feel the depression, the Cleveland ironstone miners being lowered 5 per cent., the South Wales puddlers, 7 1/2 per cent., and the millmen, 12 1/2 per cent. By the end of February Scotch pig had not recovered its tone, and prices dropped a further 2/ to 2 1/2 per ton all round. In the beginning of March the rail trade of South Wales appeared to be a trifle better, iron rails being done at 20 to 20. 5/, and steel ones at 29, there being then, as now, an inclination in all directions to order steel in place of iron. The Board

of Trade returns for February showed the total exports to be £16,482,505, in place of £17,467,256 in the same month of 1875. Statistics were also published showing that our trade with America had greatly fallen off in almost every respect. It was further set forth that out of a total of 151 furnaces in Staffordshire there were only 68 in operation. Toward the end of the month the Welsh tin plate manufacturers met at Swansea, 250 firms and 110 mills being represented, and resolved to close their works one week in every three in order to reduce the output and so improve prices, a result which was ultimately attained. April brought a slight amelioration of the condition of the Scotch pig iron market, prices being a trifle higher. Statistics were at this juncture published showing the trade of Sheffield with the United States during the quarter ending March 31st: to have been Steel, £49,464; cutlery, £29,586; files, £2116, and nails, £1619. The Board of Trade returns for March showed that the value of our exports during that month had been £17,739,101 as against £18,606,233 in the same month of the preceding year. In the Sheffield district some interruption of work resulted from the discharge of the ironworkers and their re-engagement at lower wages. The April quarterly meetings passed over without any change in prices; a fictitious steadiness, however, being imparted to some markets owing to the strike of about 32,000 colliers in South Yorkshire and North Derbyshire against a reduction of 15 per cent. This firmness naturally disappeared upon its being seen that the magnitude of the dispute in no way affected the position of the local ironmasters, the dispute itself collapsing in course of time by the men agreeing to resume at a drop of 12 1/2 per cent. The incoming of May was marked by the action of Thorneycroft & Co., who issued circulars lowering their quotations to the following: T P K, best bars, 29; best angles, 29. 10/; hoops, 29. 10/; boiler rivet iron, 211, and best 1 crown boiler plates, 211. This step was immediately followed by Messrs. Barrows, of Tipton, who lowered their boiler plates to 211, a drop of 2s per ton. This arrangement was afterward followed by other houses, about which time the world renowned house of Thorneycroft & Co. was converted into a "Limited" company. The next event of note was the award of the arbitrator appointed to settle the wages dispute in Staffordshire, who gave a decision decreasing a reduction of 7 1/2 per cent. in the wages of the iron workers of that district, the colliers at the same time being reduced at the rate of 6d. per day for the "thick coal" men, and 3d. for the "thin coal" workers. The Board of Trade returns for April again showed a decline, this time of 23 1/2 per cent., iron having fallen off 51,342 tons, and hardware and cutlery to the value of £282,000, compared with the same month of 1875. At the beginning of June, Scotch pig became steadier upon the renewed discussion of the Eastern question, and in South Wales some of the works became rather better employed, but in the North of England matters took the opposite turn, as was evinced by the discharge of nearly 800 hands by Bolekew, Vaughan & Co., and of 500 by Hopkins, Gilkes & Co. The Board of Trade statistics for May were of a rather more cheering nature, an increase being shown in the exports of cast, wrought, pig and railroad iron, the total quantity of iron and steel sent out being 233,066 tons, valued at £2,082,361, and the value of the hardware and cutlery, £263,413, the latter a decreased total. Scotch pig iron continued steady until the middle of June, when the grave state of the political atmosphere caused a relapse. The Cleveland ironmasters' statistics for May showed a total make of 179,088 tons, of which 10,042 tons went by foreign shipment (a decrease of 14,418 tons), and costwise, 32,440 tons (an increase of 10,000 tons), leaving the stock on hand at the beginning of June 113,628 tons. At this time the annual report of Charles Cammell & Co., (Limited), Sheffield, attracted attention, the year's profits being shown to be the handsome sum of £106,869, yielding a dividend of 10 per cent., against 7 1/2 per cent. in the previous year. A few days later the report of John Brown & Co. (Limited), Sheffield, was issued and showed a profit of £80,549, also furnishing a dividend of 10 per cent. The good effect of the statements was, however, almost nullified by the failure of Mr. J. H. Garbutt, of London and Darlington, for £170,000, and the statement that the Ebbw Vale Co., South Wales, had lost £164,425 on the year's trading—a total loss up to that time of £221,000. The death of Mr. James Baird, the great Scotch ironmaster, also cast a gloom over the iron trade of that kingdom, so that, whether for that or other causes, Scotch pig iron became dull to demand and weak at the following prices: Gartsherrie No. 1, 65/; No. 3, 68; Coltness No. 1, 69/; No. 3, 55/; Summerlee No. 1, 63/; No. 3, 57/6; Langloan No. 1, 67/6; No. 3, 51/6; Calder No. 1, 65/6; No. 3, 58/; Gleggarnock No. 1, 65/6; No. 3, 58/; Eglinton No. 1, 57/6; No. 3, 56/6; Dalmellington No. 1, 57/6; No. 3, 56/6; and Shotts No. 1, 68/; No. 3, 59/ per ton. In the Sheffield district, and also in Staffordshire, the quietude of trade was still marked, but in Wales some steel rail orders were secured at hardly over 27 per ton. Early in July Serbia declared war against Turkey, the trade outlook being thereby rendered still more gloomy, and several heavy failures at Sheffield and elsewhere precipitated. At this time there were 116 furnaces in blast in Scotland and only 57 in Staffordshire, the mills in the latter important district only running about one-third of full time. The South Wales tin plate manufacturers again met, and decided to continue the restricted production until the end of the September quarter. The Easterners continued to cause much uneasiness, and by the middle of July further considerable commercial stoppages were announced in London, Dundee, &c. The Board of Trade returns, showing the June exports, set forth a falling off in iron and steel of 30,613 tons, and hardware and cutlery of the value of £24,692. In consequence of the dullness of the rail trade hematite pigs were now lowered 10/ per ton, but presently recovered to the extent of 2/6 per ton. The July quarterly meeting brought about no change, market bars remaining thereafter, and still, at 29, with 12/6 extra for Lord Dudley's iron; single sheets at 29. 7/6 to 29. 10/; good sheets 210; "Severn" singles, 213, and Baidwin's B sheets, 216; common bars being obtainable at any price between 27 and 27. 10/ per ton. Towards the end of July the sworn accountant of the Northern Board of Arbitration issued his quarterly statement, showing that the total weight invoiced in the district in the three months ending May 31 had been 168,064 tons, the average price of iron rails having been 26. 11/8; plates, 27. 13/; bars, 27. 11/6, and angles, 27. 4/2. About the 20th of the month the heat was so insupportable that many of the iron and steel workers had to cease operations in the day time. There was also the failure of Thomas Vaughan & Co., of Middlesbrough, &c., about this time, the liabilities being stated to be nearly £1,000,000, and of Raylton, Dixon & Co., of the same district, with debts set down at £200,000. The advent of August brought further failures, among them being those of Thomas Charlton & Co., of Hartlepool, Middlesbrough, &c., owing £250,000; J. B. Walker & Co. with debts reaching over £20,000, and George Bower, West Hartlepool, with liabilities amounting to £70,000. These stoppages naturally caused a feeling of great distrust, and there were rumors of failures in other districts, some of which afterward came

(Continued on page 11.)

RUSSELL & ERWIN MANUFACTURING COMPANY,

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1839.

1877.

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VOLUME 3, 1875, contains a full line of **GENERAL HARDWARE**, which we offer as Manufacturers' Agents or at manufacturers' prices, **CONTAINING IN PART:**

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And the celebrated "ELECTRIC SHEARS." Nickel Plated
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The only knives made that are put together in such a manner that there is no strain on the covering or frail part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the Best American Knives. We also make

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All blades forged from the best English Cast Steel, and Warranted. Each knife made in the most substantial and compact manner, all articles used being of the best quality. All blades stamped Owen & Campbell, Philadelphia.

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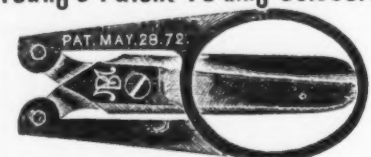
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These Scissors are made of the very best steel, nickel plated, and so constructed that they can be readily folded and carried in the pocket without injury to the garments. A sample pair will be sent by mail, to the trade only, upon receipt of the retail price, namely: For small size, either blunt or pointed, \$1.00; Large size, pointed or half pointed, \$1.50. New York, Feb. 1st, 1876.

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Salesroom, 295 Broadway, New York, with

LONDON, FRARY & CLARK.

(Continued from page 9.)

The British Iron Trade of 1876.

about. The July exports were shown to be again smaller, iron and steel having declined 60,857 tons. The Middlesbrough returns for the same month stated there were 71 furnaces in blast out of 87 in the district, stocks having by an increment of 10,227 tons, reached a total of 65,362 tons. The same report also chronicled a peaceful reduction of 10 per cent. in the blast furnaces' wages. Scotch pig iron remained quiet and easy, albeit the shipments were well upheld. In the Sheffield district a more hopeful feeling prevailed, but there was no visible alteration for the better. At Birmingham, nevertheless, some sorts of iron met with an improved sale, especially good stamping sheets, which were quoted at £13 to £17 per ton. About the same time, too, South Wales began to turn out more iron, and the great works there began to vigorously set about constructing Bessemer steel plant for rail making purposes, in the full conviction that iron rails had had their day—a fact demonstrated by the difference in prices being hardly more than £1. 10/ per ton. The end of August was signalized by a general reduction "all round" of 30/ per ton in the prices of best Yorkshire iron. The Bowling new figures being £20 for bars, £26 for sheets, £26 for welding tubes, and £24 for T iron. No change was however made in the quotations of common Yorkshire iron, which was still greatly neglected. The beginning of September was marked by further commercial disasters, among the most serious stoppages being Swan, Coates & Co., for £250,000; the Lackenby Iron Co., for £300,000; and G. W. Dyson & Co., Sheffield, for £40,000. In various quarters, however, these events had been foreseen and discounted; hence it is not surprising to find that in Scotland and elsewhere pig iron grew firmer, and better prices became the rule. The Cleveland returns for August showed 113 furnaces in and 48 out of blast, the total make of pig being 171,398 tons against 166,241 in the same month of 1875. In the Sheffield locality the chief features of interest were the reports of the Sheepbridge and Staveley Iron companies, the former dividing £18,883 at the rate of 8 per cent., and the latter £28,537 at the rate of 5 per cent. In South Wales the puddlers at the Vernon Tin Works were lowered from 9/ to 8/3 per ton, the ballers being also reduced thence, and the shinglers a similar amount per ton. The August exports once more appeared to disadvantage, the falling off in pig iron being 14,000 tons; angles, etc., 5000 tons; railroad, 11,000 tons; plates, 1000 tons; steel, 600 tons; hardware and cutlery to the value of £80,000, and the items classified as "various," £120,000. In tin plates a better business had been done to the extent of 700 tons, and in machinery to the value of £17,000. By the middle of September the symptoms of a slight revival of trade began to be more generally felt, and Scotch pig iron became rather firmer in price. Several failures—among them Mr. Hickman, of Dudley, for £40,000—somewhat shaded the budding change, but in Scotland the alteration was rapidly confirmed. Wales, perhaps, remained worse than before, it being elicited that of 115 furnaces only 40 were in use. At this juncture, the removal to America of part of the cast steel business of Sanderson Bros. & Co. (Limited), of Sheffield, attracted much attention, some indicating local protectionists being able, shortly afterward, to obtain the opinions of Lord Carnarvon and Mr. Gladstone on the subject. The returns showing the trade of Sheffield with America in the September quarter were also rather alarming, the figures for the nine months of the year being £385,672, of which £132,771 fell to the September quarter, the chief exports being: Steel, £62,786; cutlery, £28,808; files, £2751, and tools, £2384—all materially less than in the same periods of many former years. The Board of Trade returns for September were again disappointing, the falling off in pig iron being 1300 tons; railroad iron, 9000 tons; bars, angles, etc., 1100 tons; cast, 2700 tons; and hardware of the value of £60,000. But on the other hand symptoms of an improvement were manifested by an increase of 1000 tons in the exports of wire, 1300 tons of tin plates and 100 tons of unwrought steel above the quantities shipped during the same period of 1875. The Cleveland sworn returns were also issued about this time for the three months ending in August, and were chiefly interesting as demonstrating the prices at which the leading products of that district has been sold. The total reached 93,431 tons, the average price of rails having been £6. 3/9; plates, £7. 8/6; bars, £6. 19/11; and angles, £6. 18/4 per ton. The current rates in October for Scotch pig remained steady, some figures being rather firmer in Wales. Steel rails were quoted as low as £7 to £7. 2/6, a price one of the leading concerns secured several orders of moderate proportions. In the North of England the iron masters, taking time by the forelock, gave notice to their men terminating all engagements on December 31, with the evident intention of lowering wages thereafter. The current price paid to the puddlers is 8/3 per ton. At Sheffield the Albion Iron, Steel and Wire Co. was now wound up, having lost about £75,000 in three years' operations. Then came the Wolverhampton and Birmingham quarterly meetings, but no change was made in prices, the producers being firm, while merchants and other classes of buyers declared their inability to make purchases unless at lower rates. By the end of October the Eastern question again came into prominence, and appeared so threatening that traders became alarmed, and the budding improvement of business sustained a check from which it has not yet recovered. November opened rather more cheerfully, when it became known that an armistice had been signed by the combatants in the East. Scotch pig iron grew steadier, and presently prices went up, partly owing to the operations of speculators, but mostly by reason of a good shipping demand. In other directions the outlook was not so hopeful, especially in South Wales, where the iron rail trade (according to Mr. Menelaus, of Downais, and Mr. Edward Williams, of Middlesbrough, two competent authorities), was entirely at an end. Mr. Menelaus, indeed, went so far as to assert that for eight years past iron making in Wales had not as a rule been profitable. The Board of Trade's returns for October showed a further falling off, particularly in railroad iron and hardware, while the shipments of pig had increased. Throughout the month of November the Glasgow pig iron market was rather feverish, and some of the leading brands experienced larger fluctuations in both directions than for some time before. By the end of the month, however, a more hopeful feeling had sprung in the Midlands, especially at Sheffield, where pig iron, foundry and engineering articles began to move off more rapidly. The steel trade of that town, nevertheless, remained quiet, as it has been all the year, and is now in that condition. December came in while matters generally were in the same state. The November exports were shown to have been of the total value of £16,510,627, against £15,356,689 in November, 1875, a decline of £1,154,000, or a little over 9 per cent. The aggregate value for the eleven months of this year, ending November 30, reached £185,306,336, against £206,144,827 for the same period of last year. The value of the iron and steel exports for the month was

£1,735,703 for 180,173 tons; £19,288,904 for the eleven months, during which 2,063,860 tons were sent out of the country. The value of the machinery and millwork exported in November was £399,693, and for the eleven months £4,887,210, as against £5,989,466 in the same period of 1875; pig iron, hoops and tin plates were, nevertheless, exported on a larger scale, and it is precisely as regards these goods that trade is now amending. At present it is, of course, impossible to say with precision what the year's exports will prove to have been, as the returns will not be available before January 10, 1877, or thereabout. That the total will fall short of last year's is, however, quite patent, as the aggregate iron and steel exports for 1875 were 2,455,640 tons, of the value of £25,781,431. If we assume the December iron, &c., exports to be of equal value with those of last month, we shall still have to lament a diminution representing a money value of nearly £5,000,000. At the time of writing, the year has so far advanced that its actual business may be said to have been brought to a conclusion, deliveries of orders in hand, of course, being excepted. Taken as an entity, 1876 cannot be said to have been wholly bad for the iron trade and its allied industries. During the twelve months many toiling concerns have fallen, much ruin and ruinous home competition has been swept away, and, above all, business has been carried on in a cautious manner, so that speculation has been kept under, nor has the production been greatly in excess of the demand. There are now, in all probability, nearly half the blast furnaces of the whole country in disuse, but we hear on all sides of an improvement which will doubtless bring us better things in 1877 than we have had in 1876.

Statistically, the position is as follows: There are now 116 furnaces in blast in Scotland, out of a total of 157, and on December 10th there were 100,180 tons in Messrs. Connal & Co.'s stores, that being an increase during the year of about 36,000 tons; beside this there are probably about 150,000 tons in the makers' yards. Up to date this year there have been 443,251 tons of Scotch pig shipped (a decrease of 71,959 tons), of which 23,793 tons have been foreign and 154,453 coastwise. The total imports of pig iron from Middlesbrough into Scotland up to December 9th have been 215,000 tons, an increase of rather over 70,000 tons as compared with last year. The monthly average price of Scotch warrants have been: January, 64/5; February, 61/; March, 59/0/2; April, 58/7/4; May, 57/11; June, 57/7/2; July, 56/8/2; August, 56/3/2; September, 56/4; October, 57/0/2; November, 58/4, and December so far, about 58/9. Makers' brands (No. 1) are: Gartsherrie, No. 1, 65/; Coltness, 71; Summerlee, 64; Langloan, 66; Govan, 59; Calder, 66; Shotts, 65; Cambus, 60; Monkland, 59; Glenarnock, 63/6; Eglinton, 59/; Dalmeilston, 59, and Carron, 65/.

In other parts of the country the statistics are not yet completed, but it may be broadly stated that about half the furnaces are out of blast.

Manganese Phosphorus and Silicon in Steel.

Office of THE ALBANY & RENSAELAER IRON AND STEEL COMPANY, Troy, N. Y., Dec. 8th, 1876.

To the Editor of The Iron Age: In your kind notice of the Centennial exhibits of this company, published in a recent issue of The Iron Age, I find, among other typographical errors, which no doubt have annoyed you more than your readers, that the analysis of a sample piece of steel reads:

Carbon	0.25
Phosphorus	0.066
Sulphur	0.065
Manganese	0.12
Silicon	0.02

The manganese should have been given as 1.12 per cent. The difference in that element would so completely alter the character of the steel that I take the liberty of calling your attention to the misprint.

Permit me to add that we have not stood still in the manufacture of fine grades of steel, but are now producing metal containing phosphorus as low as 0.035, and silicon 0.018. You will see that our friends, the Swedes, are not far in advance of us.

Yours, truly,

ROBERT W. HUNT, Gen'l. Supt.

Detecting Leaks in Tuyeres.—In a letter suggested by our recent article on "Spray Tuyeres," in which the difficulty of telling when they are leaking is urged against coil tuyeres, Messrs. Atkins Bros., of Pottsville, Pa., say: "We have had a plan in use several years which we have never known to fail, and it may be of interest to some of your readers. When the blast is off we take a rod of small, round iron which will reach to the nose of the tuyere and run it in the plug hole. If the tuyere is leaking the rod will always show damp, even when the coil is leaking on the outside. This plan is very little trouble, and we have always found it sure."

Edward Brown's Pyrometer.—A slight inaccuracy occurred in the notice of Edward Brown's pyrometers, published in our last issue. In the original gauntlet pyrometer the stem was composed of a bar of iron and a tube of brass. Mr. Brown's improvement, upon which he has letters patent, consists in the substitution of a bar of plumbago, and a tube of iron in place of the above.

The proprietors of the LaBelle Steel Works, Messrs. Smith, Sutton & Co., Pittsburgh, Pa., have sent the following circular to their friends and customers: "Since our steel rolling mills were destroyed by fire on the 9th ultimo, we have erected temporary buildings until we can have our new iron buildings finished. We have repaired and renewed our machinery, and will be in operation again, and ready to fill orders for steel and axles on and after this date. We are pushing the work of renewing the machinery in our spring department, and will have it in operation on the 15th inst."

During the whole of the last year the National Horse Nail Co., of Vergennes, Vt., ran with full number of hands. During 1876 their product has been greater and sales larger than in any previous years. This has largely been due to the good reputation of the nails, and their excellent finish and good quality. They received very flattering mention from the Centennial Jury of Award.

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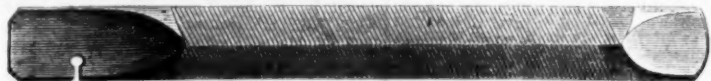
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Special attention is called to my new Centennial Saw, patented March 28th, 1876; Special File and Saw-Set combined, patented June 30th, 1876; Cross Cut (Loop) Saw Handle, patented February 15th, 1876; New One-Man Saw, with Patent Double Removable Handle Attachment, March 28th, 1876; New Patent Champion Clearer Tooth, patented August 15th, 1876; Saw Set, patented Nov. 25th, 1873—a perfect Set that a blind man can use to condense like a Hammer Set perfectly; Cross-bar Wood Saw Frame, patented Nov. 12, 1876; also Cross-Cut Handle, with castings, patented Feb. 15, 1870. These goods complete the scientific tools for cutting timber, instead of wearing it off with notched teeth (which are like a fractured plate sharpened).



AWARDED CENTENNIAL MEDAL AFTER ACTUAL TEST.

REPORT ON AWARDS. GROUP No. 15.

Product: Saws in great variety: special improvement in shape of teeth, called Patent Lightning Saw. Name and Address of Exhibitor: Eben Moody Boynton, New York. The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz: Report: "Being of very Superior Quality and of great Practical Utility." DANIEL STEINMETZ, Signature of the Judge.

J. D. IMBODEN, of Virginia, CHARLES STAPLES, of Maine, G. L. REED, of Penn., J. DIFENBACH, of Germany, DAVID McHARDY, of Scotland, D. STEINMETZ, of Phila. JUDGES.

A true copy of the record. FRANCIS A. WALKER, Chief of the Bureau of Awards. Given by authority of the U. S. Centennial Commission. J. L. CAMPBELL, Sec'y. A. T. GOSHORN, Director General. J. R. HAWLEY, Pres.

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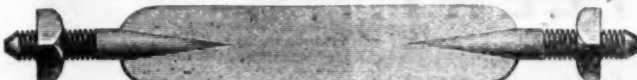
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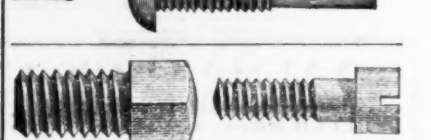
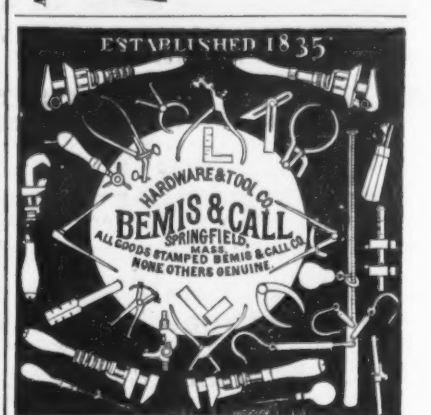
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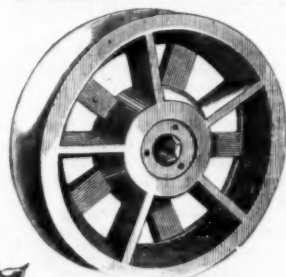
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The Iron Age.

New York, Thursday, January 4, 1877.

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The Duty on Siemens-Martin Steel.

There has lately been some confusion growing out of conflicting Treasury decisions relating to the assessment of duties on Siemens-Martin steel, which has given rise to no little trouble to customs officers, as well as to importers. The decision of the Secretary of the Treasury, given under date of December 1st, 1874, held that the product of the Siemens-Martin process should be classified as steel, and pay duty as such. The decision of July 14th, 1876, declares that as both iron and steel are products of the Siemens-Martin process, such product is not necessarily steel, and must be appraised after its quality has been determined "by such tests as are recognized by experts and practical workers

of metals." With a view to securing expert testimony on these points, Hon. A. S. Hewitt submitted the question of whether Siemens-Martin metal is steel or iron to Mr. A. S. Holley and Mr. R. W. Raymond. These gentlemen have considered the subject very intelligently and at considerable length in letters given to the public, which agree perfectly on the main question, viz., that the product of the Bessemer and Siemens-Martin processes are always and invariably steel. We regret that we cannot make room for these letters in full, but the concluding paragraphs will serve to show the drift of the argument, as well as the conclusions reached. After discussing at some length the usages of the trade and the proposed new nomenclature, Mr. Holley says:

What the Treasury Department desires to do is to levy the same duty on products which are in their qualities and uses substantially alike. Now it has been shown that the Martin, the Bessemer and the crucible products are substantially alike, because they are all made homogeneously by fusion. But the Martin and Bessemer products are more strikingly alike in other respects.

1st. The Martin and Bessemer products are both, to a certain extent, pneumatic; that is to say, both are directly derived from crude cast iron in certain proportions, from which the impurities are partly but not wholly oxidized and removed by atmospheric air.

2d. Both processes make both very hard and very soft products, and all intermediate grades. Both produce "steels" which are employed on a large and commercially successful scale for the manufacture of razors, miscellaneous cutting tools, springs and other articles, which will harden when quenched in water while at a red heat. Both also produce "steels" in which the carbon is lower than it is in many forms of "wrought" or puddled iron, and which are, therefore, largely used for boiler plates and for many other purposes, the criterion of fitness being that they shall not harden when quenched in water while at red heat.

3d. Products of the Bessemer process cannot be distinguished either by chemical analysis or by mechanical tests from products of the same grades which are made by the Martin or by the crucible process. In other words, there is no test known in the arts which can positively determine by which of the three processes mentioned a given piece of "steel" was made, if it is within the usual grades of structural steel.

4th. It is true that the Bessemer and Martin processes differ in several respects, most largely in the time and in the apparatus employed; but the question is not intrinsically one of processes, but of products. While the purification of the crude materials is somewhat greater in the Martin than in the Bessemer process, the same chemical reactions occur, and the same materials produce the same general class of products by both processes. Precisely the same amounts of the same materials are sometimes successfully employed in both processes. Some Bessemer steel is better than some Martin steel of the same grade, and vice versa.

For a large number of purposes, the products of both processes are used indiscriminately. For instance, both products are made and sold in this country for railway axles, for fire-arms, for miscellaneous merchant and machinery bars, and for rails. On the London and North-western Railway in England, most of the locomotive boiler plates employed are Bessemer, a smaller number are Martin, and a still smaller number are crucible plates. In the French government shipyards, both Bessemer and Martin products are used for similar parts of ships and machinery. In the French steel works, boiler plates, rails and general machinery and structural steels are made by both processes, and in many cases at the same cost. In Great Britain, rails and railway tires and axles are largely produced by both processes, generally at the same cost. In some localities the Martin product is cheaper than the Bessemer product; in other localities the reverse is the case.

In conclusion: The evidence is thus abundant and universal, that the products of the Bessemer and the Martin processes are, to a great extent, interchangeable, regarding both quality and cost; that they cannot be distinguished by practicable tests, either from each other, or from crucible steel of the lower grades, and that they should therefore be subject to the same customs duties. The simple names of the Bessemer and Martin processes would for this purpose be a sufficiently definite classification.

In concluding his letter, which approaches the subject from a somewhat different standpoint, Mr. Raymond says:

The fact, as thus deduced from threefold usage, according to equity, policy and the intent of the law. The soft Martin steels are made by the same process as the harder varieties; but they are made at greater cost and command a higher price. To classify them as iron, at a lower duty, is contrary to the principles of revenue and protective tariff legislation alike.

To call soft Martin steel "iron," while exactly the same metal produced by other methods is classed and taxed as steel, would simply lead to the importation of "Martin iron" or Bessemer and crucible steel, and thus to a further loss of revenue and defeat of protection.

Since there are no "recognized tests" now existing by which homogeneous, cast, malleable metal can be positively determined to be iron and not steel, the adjudication of such a question by revenue officers would be uncertain and variable, different officers having different standards.

Finally, while differences of opinion as to theoretical definition do exist among experts, it may be said without hesitation that all parties agree as to what is the actual and uniform commercial usage, and all parties agree that this usage should be the basis of revenue legislation and administration.

If the foregoing considerations, and such others as may be suggested, are not sufficient to induce the department to return to its former (and, in my judgment, more consistent and reasonable) construction of the law, Congress should at once give the relief which the case requires, by prescribing that the products of the Martin process shall be rated, like the similar products of the Bessemer process, as steel.

We think that the intelligent reader will fully agree with Messrs. Holley and Raymond, and it is to be hoped that the Treasury Department will rescind the decision of July last, and adhere to the more intelligent ruling of 1864.

Our English letter published in the present issue, dated Dec. 18th, is as usual, of

great interest. For some time past our foreign correspondence has been greatly interrupted, week before last no letter at all was received from England, and last week it was greatly behind. The succession of heavy westerly gales, of which we spoke last week, has greatly impeded ocean travel, prolonging voyages in some instances to 21 days. So furious have been the gales that in one instance an ocean steamer made but twenty-four miles in as many hours on her last voyage to this port. Mails seem to be arriving with more regularity at present, and we hope in the future that our English mails will not be delayed. They are always interesting and new, and our readers miss them when they do not reach us in time for publication.

The Ashtabula Accident.

On Saturday, Dec. 30th, while a train was crossing a bridge at Ashtabula, on the Lake Shore road, the bridge gave way, and eleven cars and one of the two engines hauling the train fell 65 feet into the creek below. The wreck at once took fire, and those who had not been killed or drowned were burned. Probably 120 persons perished.

The catastrophe, by its magnitude and horror, stands apart from all others that have happened in the country for years. No feature that could increase the terror of the accident was omitted—the unobstructed fall, the plunge into the creek, the smashing of the cars into fragments, a blustering snowstorm, and last and worst of all, the fire which burned alive those who were not killed outright, burning, too, with a clear flame, no friendly cloud of smoke coming to end the agony before the fire began its work. To the engineer the accident seems a most disquieting one. Every precaution, so far as has been ascertained, had been taken. The train was heavy, it is true, and then there were two engines attached, yet it was just such a train as any superintendent on a trunk line might have occasion to make up. The road is one having a good reputation for its bridges, permanent way, and rolling stock. Some evidence at the inquest tends to show that a car and perhaps an engine jumped the rails a few seconds before the bridge went down, but they were not apparently hardly off, and the dragging of one or two and the pounding of one or two cars, or an engine, for a few seconds over the ties should not strain a safe bridge beyond its powers of endurance. Until after the coroner's inquest, we shall probably know very little in regard to the character of the bridge or the causes of the disaster.

The danger from fire is an ever present one in case of severe accidents like the falling of a bridge. Many roads still use kerosene oil for lighting cars, stipulating that its fire test shall be 150°. Others think themselves safe when they return to sperm candles, yet these have been known to set cars on fire, and are, we think, only a little less dangerous than kerosene. Mineral sperm, lard, or some other oil of a similar character are safe, and danger from their use need not be apprehended. With such methods of heating and illumination as are generally used, however, the burning of an utterly wrecked palace or passenger car in the winter time seems to be a certainty. Engineers certainly expect it, and yet it can be certainly guarded against. In the winter the stoves are more dangerous than the lamps, and we note the fact that one of the stoves broke loose before the car struck, and probably before there was much wrecking of timbers. However blameless the railroad may be in general in regard to this accident, we do not believe there is any need of a wreck taking fire, unless it be from the engine.

We shall consider this disaster more fully when we have more exact information concerning its causes.

David Forbes.

The iron trade has sustained an irreparable loss in the death of Mr. David Forbes, F. R. S., Foreign Secretary of the British Iron and Steel Institute. In this capacity he has, almost from the foundation of the Institute, rendered most essential service, and has in no inconsiderable degree contributed to that large prosperity which has characterized its existence. His exhaustive reports on the foreign iron and steel industries which appeared in the *Journal* were invaluable, as they embraced everything of interest in connection with the iron trade all over the world. The wonderful linguistic accomplishments of Mr. Forbes enabled him to deal easily with the publications of all countries where iron and steel is made. His name was so well known abroad that the leading people connected with the technological features of iron making readily furnished full details of what was transpiring in each country, and it was mainly through his influence that the Institute gained a recognized position abroad. As a chemist, a mineralogist and geologist, Mr. Forbes occupied a very

high position, and in each of these departments he has left behind him a mass of material—the result of his personal investigations—that will, we fear, be now lost to science. It was the intention of the deceased gentleman to have devoted the rest of his life to publishing this information, which was almost exclusively novel. He was also an accomplished metallurgist and engineer. The last great work he undertook was the opening out of the Rio Tinto Mines, in Spain, with a railroad to connect them with the port of Huelva. It was during an inspection of these works, and at the time of the Carlist war, that Mr. Forbes was prostrated by sunstroke, from the effects of which he never fully recovered. His vast store of information as a traveler, coupled with his genial disposition and sterling honesty of purpose, gained him a large circle of friends, who will deeply deplore his sudden death at the comparatively early age of 49.

Our English neighbor, the *Iron and Coal Trades Review*, is injudicious. In commenting on a recent article in *The Iron Age* on the condition of the iron trade, it turns state's evidence on its friends in the following fashion:

The writer of this article leaves out of consideration altogether the exceptional encouragement which the ironmasters of the States derive from the high protective tariff, and there is no doubt that if this tariff were either removed or very considerably modified, not only would the iron manufacturers of the States find themselves unable to compete with European nations in many of their own markets, but they would find it quite impossible to do anything like a trade outside their own country.

This is not quite true, but if we were working in the interest of free trade, it would be the last thing we should say, even if we thought so. The "exceptional encouragement" derived from protection has placed our iron industries on a basis far more substantial than our English friends suppose. But home competition is stronger to-day than foreign competition ever was or ever will be again, and if our friends across the Atlantic will give up the hopes of regaining the control of the American markets, they will save themselves a great deal of anxiety of mind concerning our tariff policy.

New Publications.

A CONCISE HISTORY OF THE IRON MANUFACTURE OF THE AMERICAN COLONIES TO THE REVOLUTION—ART AND OF PENNSYLVANIA FROM THEN TO THE PRESENT TIME. By John B. Pease, A. M., Metallurgist, Engineer, Commissioner of Geological Survey of Pennsylvania, &c. 300 pages. Allen, Lane & Scott, 333 South Fifth street, Philadelphia, Pa.

This book is written with a view of collecting and publishing in an interesting form all accessible facts relating to the localities, methods and costs of the manufacture of iron in the different colonies up to the close of the Revolution, and in Pennsylvania from the year 1717—the date of the inception of the trade in this country—to the present time. The work thus includes all the most interesting changes and improvements that have been made.

The work is well illustrated, both with views and plans of old works, and matters of interest connected with them. In historical matter the work is brimming over with interesting facts pleasantly told. We have rarely met with a work of the character in which the reader's interest is so constantly sustained from first to last, and while the work is intended to be as much for reference as for reading, containing a great quantity of statistical and tabular matter, we have been almost compelled to take it up and read it in course as we should any other history. The recent history of the manufacture of iron in Pennsylvania embraces every improvement made in the various processes. A large map shows the location of iron ore, coal beds, and the iron works of the State. Neither author nor publishers seem to have spared any pains to make the work all that could be desired, both in completeness, accuracy and interest.

Review of the Western Iron Trade for 1876.

PIG IRON.

The pig iron market in the West during the past year has been marked by a steadiness in price, large reduction in stocks, a hand-to-hand policy in buying, entire absence of any speculative demand, and somewhat of a reduction in the cost of manufacture.

COKE PIG IRON.

The course of the market for gray forge pig, smelted with coke or bituminous coal from Lake Superior ores, has been peculiar and baffling. There were many reasons why an advance should have been looked for during the year. As will be seen in our report on stocks they were very light and decreasing. A purchase of one thousand tons apiece by the mills of Pittsburgh would have stripped the market. Many furnaces were out of blast, and as numbers of these were well situated, owned by men of large capital and experience in the iron business, the fact that they remained idle was the best evidence that they could not see any money in the business, and could better afford to lose the interest on their capital and the inevitable depreciation of their property from idleness rather than start; and yet in the face of this there was no appreciation in prices, but on the face of the quotation a decline—not a real one, however, as we shall show below. The market for these irons in Pittsburgh,

which may be taken as the exponent of the whole West, opened dull, with standard gray forge selling at \$22.50, some extra brands commanding 50c. a ton more, and inferior ones \$1 less. All during January and most of February there was little inclination to buy, and the spring market having nearly passed without any improvement either in price or demand, the close of February brought a decline, \$22 to \$22.25 being the best figure that could be obtained even for choice brands. The first week in March saw an improved demand, but the failure of Zug & Co. unsettled the market, and led holders of pig to question the future and to determine to realize, and the price fell to \$22. The formation of the Western Nail and Iron Association in April gave a better tone to the market and led to some large sales, though prices were not materially advanced. The puddlers strike in June, which was of short duration, had but little effect on prices, and from July on there has been but little change in price, \$21 to \$22, 4 mos., being a fair quotation. The variation has not been over \$1 per ton decline in this year. As we have indicated above this decline is more seeming than real. The use of cinder has caused a deterioration in the quality of the iron, and the forge iron quoted at the close of the year is not as good as that at the commencement, by at least the difference in price. Bearing this in mind it would be fair to say that the price of coke pig has been well maintained during the year.

It should be noted in this connection that the increased use of old rails in the rolling mills has not been without its effect on pig iron. Some mills are using at least 50 per cent. of old rails, and so great has the demand become in some sections as to create a famine.

It is difficult to form any opinion regarding the price for the coming year. We hardly look for an immediate advance, though it may come any day. Stocks are so light that the least indications of a brick demand would cause a sharp advance in prices, but we hardly believe that there can be an advance in the price of such iron as is now being made at many of the Western furnaces, though a demand for such iron as was made two or three years ago could not be supplied except at an advance.

We give below the range of prices at Pittsburgh for gray forge bituminous irons for each month from 1869 to 1876, inclusive. The quotations are all on a basis of four months' time, and do not include either fancy brands or the very inferior grades but the ordinary run of forge irons:

Range of Prices at Pittsburgh of Gray Forge Coke or Bituminous Pig Iron Smelted from Lake Superior Ore for each Month, from Jan., 1869, to Dec., 1876, Compiled from Actual Sales.

Month.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.
January.....	\$21.50 @ \$23.00	\$23.00 @ \$24.00	\$23.00 @ \$24.00	\$23.00 @ \$24.00	\$23.00 @ \$24.00	\$23.00 @ \$24.00	\$23.00 @ \$24.00	\$23.00 @ \$24.00
February.....	\$22.00 @ \$23.00	\$23.00 @ \$24.00	\$23.00 @ \$24.00	\$23.00 @ \$24.00	\$23.00 @ \$24.00	\$23.00 @ \$24.00	\$23.00 @ \$24.00	\$23.00 @ \$24.00
March.....	\$21.00 @ \$22.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00
April.....	\$21.00 @ \$22.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00
May.....	\$21.00 @ \$22.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00
June.....	\$21.00 @ \$22.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00
July.....	\$21.00 @ \$22.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00
August.....	\$21.00 @ \$22.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00
September.....	\$21.00 @ \$22.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00
October.....	\$21.00 @ \$22.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00
November.....	\$21.00 @ \$22.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00
December.....	\$21.00 @ \$22.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00	\$22.00 @ \$23.00

STOCKS OF COKE PIG.

It has been no secret that the stocks of bituminous pig iron has been largely reduced during the year, not only on the furnace bank and in the brokers' yards, but also at the mills. As shown by the reports of the American Iron and Steel Association, the only considerable reduction in unsold stocks in the lands of furnace men in 1875 was in the bituminous irons of the West. The stock of these irons on the first day of January, 1875, was as follows:

State.	1875.	1876.	1877.
Western Pennsylvania.....	61,340	11,595	11,595
Kentucky.....	1,195	1,195	1,195
Tennessee.....	2,000	2,000	2,000
Ohio.....	68,968	68,968	68,968
Michigan and Indiana.....	7,181	7,181	7,181
Illinois.....	5,816	5,816	5,816
Wisconsin.....	1,539	1,539	1,539
Missouri.....	8,368	8,368	8,368
Total.....	161,595	161,595	161,595

It is too early in the year for complete detailed statements of stocks, but from positive information, and from a careful observation made during the year, we know that these stocks have been very much reduced. Take Pittsburgh as an example. The stocks in brokers' yards in this city January 1st, 1876 and 1877, were as follows:

Grade of Iron.	Jan. 1, 1876.	Jan. 1, 1877.	Dec. 1, 1876.
Coke Forge.....	25,500	15,000	10,500
Coke Foundry.....	2,500	750	1,750
Charcoal, all grades.....	14,000	6,500	7,500
Total.....	42,000	22,440	19,550

The stock of forge iron unsold at the furnace in Allegheny county was reported at 4920 tons January, 1876. It is not 1500 tons January 1st, 1877. In the Shenango Valley there is on the furnace bank unsold, say, 15,000 tons; in the Mahoning Valley, say, 15,000 tons; in the Allegheny Valley, 17,000 tons, though this should hardly be included as it is cold-short, and can only be used as a mixture; in the Youghiogheny Valley, 500 tons; and in Ohio, outside of the Mahoning Valley, 20,000 to 25,000 tons. Taking these figures as a basis, we think 100,000 tons would be a fair estimate of the stock of mill iron in the West.

There is another noticeable feature regarding stocks, and one that rarely has a place in statistical tables, viz., the stocks at the mills. The reduction in these during the year has been very great, so that in addition to bare furnace banks we have bare mill yards. One prominent rolling mill firm in Pittsburgh had in their yard January 1, 1876, from 10,000 to 12,000 tons of metal, last Saturday they had not to exceed 500 tons, and the same condition holds good with most of the Western mills. It is such facts as these that lead us to the opinion that when the demand does come it will cause such a dearth of pig iron for sale as the West has rarely seen.

CONDITION OF THE FURNACES.

As will be seen from the partial list we give below of coke furnaces in and out of blast January 1, 1876, and 1877, there has been but comparatively little change in this respect, about 50 per cent. of the furnaces in the list being in blast January, 1876, and 45 per cent. January, 1877. Those who wish to see how it compares with the first of last September can do so by referring to our last issue in September:

Partial list of Bituminous Furnaces in and out of blast Jan. 1, 1876 and 1877.

Locality.	In blast Jan. 1, 1876.	In blast Jan. 1, 1877.	Out of blast Jan. 1, 1876.	Out of blast Jan. 1, 1877.
Shenango Valley.....	12	11	30	20
Pittsburgh and vicinity.....	6	6	6	6
Allegheny Valley.....	15	14	4	4
Youghiogheny Valley.....	15	15	20	20
Monaca and Conemaugh.....	3	1	3	5
West Virginia.....	12	10	10	11
Mahoning Valley.....	8	4	7	11
Hanging Rock.....	9	4	7	11
Various Ohio localities.....	19	16	7	12
Missouri.....	3	2	6	6
Total.....	77	69	78	86

CHARCOAL PIG IRONS.

There has been more of a decline in this class of iron during the year than in coke iron. At Cincinnati, where the market shows the course of

HANGING ROCK CHARCOAL.

irons, the year opened with No. 1 hot blast charcoal iron \$25 to \$26 per ton. February took off an additional dollar, the quotation the middle of that month having been \$24 to \$25. From this to the close of the year there was little change. Mr. Sidney D. Maxwell, the able superintendent of the Cincinnati Chamber of Commerce, in his report closing Aug. 31st, an advance copy of which we have been kindly furnished, says: "The average quotation for the year of No. 1 hot-blast charcoal iron was \$25-16, compared with \$29, \$28-3 in 1874-75, \$30-21 in 1873-74, \$35-33 in 1872-73 and \$46-74 in 1871-72. The average quotation for No. 1 hot-blast stone coal iron for the year 1875-76 was \$24-16 per ton. The great change which has been effected in the value of iron may be seen by a comparison with the figures in November, 1872, when No. 1 hot blast charcoal iron was ruling at \$38 to \$39. The decline from the highest point attained has thus been \$14 per ton. Iron in value is equal only to a fraction over 41 per cent. of the value in 1872. This grade lost in value in 1872-73, \$11 per ton; in 1873-74, \$14; in 1874-75, \$6, and in 1875-76, \$3. It will thus be seen that the smallest loss has been sustained during the past year, and when it is understood that, for over six months, there substantially has been no change, and that there are evidences of returning confidence, it may reasonably warrant the expectations of producers that at last the lowest depths have been reached."

The following table shows the quotations for all kinds of iron at Cincinnati, at the close of August, for two years, the same being per ton, save where otherwise specified:

Kinds.	1875-76.	1874-75.
Hot Blast Charcoal.		
Hanging Rock No. 1.....	\$24.00 to \$25.00	\$27.00 to \$28.00
Hanging Rock No. 2.....	\$21.00 to \$22.00	\$24.00 to \$25.00
Hanging Rock Forge.....	\$21.00 to \$22.00	\$24.00 to \$25.00
Tennessee No. 1.....	\$21.00 to \$22.00	\$24.00 to \$25.00
Tennessee Forge.....	\$21.00 to \$22.00	\$24.00 to \$25.00
Alabama No. 1.....	\$21.00 to \$22.00	\$24.00 to \$25.00
Missouri No. 1.....	\$21.00 to \$22.00	\$24.00 to \$25.00
Missouri No. 2.....	\$21.00 to \$22.00	\$24.00 to \$25.00
Hot Blast Stone Coal.		
Missouri No. 1.....	\$21.00 to \$22.00	\$24.00 to \$25.00
Missouri Forge.....	\$21.00 to \$22.00	\$24.00 to \$25.00
Ohio No. 1.....	\$21.00 to \$22.00	\$24.00 to \$25.00
Ohio Forge.....	\$21.00 to \$22.00	\$24.00 to \$25.00
Cold Blast Charcoal.		
Hanging Rock Car Wheel.....	\$30.00 to \$40.00	\$30.00 to \$40.00
Missouri Car Wheel.....	\$30.00 to \$40.00	\$30.00 to \$40.00
Red River Car Wheel.....	\$30.00 to \$40.00	\$30.00 to \$40.00
Tennessee Car Wheel.....	\$30.00 to \$40.00	\$30.00 to \$40.00
Alabama Car Wheel.....	\$30.00 to \$40.00	\$30.00 to \$40.00
Machinery and Forge.....	\$25.00 to \$30.00	\$25.00 to \$30.00
Bloom.....	\$50.00 to \$55.00	\$50.00 to \$55.00

The quotation per ton of hot-blast charcoal iron, No. 1, at Cincinnati, at the close of August during a period of 13 years, is seen in the following table:

Dates.	Per ton.
1863-64.....	\$20.00 to \$21.00
1864-65.....	\$20.00 to \$21.00
1865-66.....	\$20.00 to \$21.00
1866-67.....	\$20.00 to \$21.00
1867-68.....	\$20.00 to \$21.00
1868-69.....	\$20.00 to \$21.00
1869-70.....	\$20.00 to \$21.00
1870-71.....	\$20.00 to \$21.00
1871-72.....	\$20.00 to \$21.00
1872-73.....	\$20.00 to \$21.00
1873-74.....	\$20.00 to \$21.00
1874-75.....	\$20.00 to \$21.00
1875-76.....	\$20.00 to \$21.00

LAKE SUPERIOR CHARCOAL IRONS.

At Cleveland, which is the distributing point for Lake Superior charcoal irons, the market was reported at \$29-50, 4 mos., for No. 1 charcoal. The last of the month it declined one dollar, and the last of February 50c. more. In April another decline

of 50c., and early in May still another, at which time the quotations stood \$27. The market closed at \$26-50, with light stocks and demand. Out of the 41 charcoal furnaces in Michigan and Wisconsin only 11 are blowing, and of these the product is all sold except 9000 tons, not including the Jackson furnaces.

MISSOURI CHARCOAL IRON.

The market at St. Louis opened with some inquiries for season's deliveries, and a fair demand for immediate use, with No. 1 Missouri hot-blast charcoal ruling at \$26 to \$27, 4 mos. The last of the month the market weakened \$1, quotations being \$25 to \$26. The demand continued light, with prices unchanged, until late in March, when the demand improved somewhat, though it brought no change in prices. In April the demand became light again, and continued so until the latter part of August, when the demand grew better and continued so until the last of September, when it grew light again. About the middle of November pig declined to \$23 to \$25, at which price there was a good demand. The year ended with a dull market, price \$23 to \$25 for No. 1 hot-blast.

In regard to stocks our information is meager. The year opened with 53,407 tons on hand unsold, but this has been somewhat reduced. Of the charcoal furnaces 3 are in blast and 8 out.

MANUFACTURED IRON.

The market for merchant iron has been characterized by marked fluctuations. The year opened with a dull market and low prices. Early in the year a movement was inaugurated by the manufacturers looking to combination among themselves to establish and maintain prices. With this in view a Convention of the Merchant Iron Manufacturers west of the Allegheny Mountains met in Pittsburgh, March 15th, and adopted a revised card on a basis of 25c., which was to be the only card published, but established rates at which sales might be made as follows:

Pittsburgh and the Valleys.....	\$20
Cleveland.....	\$25
Milwaukee.....	\$24
Cincinnati.....	\$23
Louisville.....	\$23
St. Louis.....	\$23
Chicago.....	\$24

This was strictly adhered to, and on April 8th another meeting was held; some further changes made in classification of iron for the purpose of making the difference between the base sizes and extras corresponding nearly with the difference in cost of manufacture. These prices were firmly adhered to until the 6th of May, when at a meeting held at Pittsburgh, a new price was adopted to meet the views of large buyers, based on the quantity bought in three months. These prices were for Pittsburgh, 25c. for less than ten tons. For a ten ton lot in one shipment 1-10th off. The price at Cleveland was 5c. per 100 above this; at Cincinnati and Louisville, 10c.; Chicago, 15c.; St. Louis, 20c.

Additional discounts for quantity to be made as follows from the card:

Over 10 tons and up to 100 tons, drawn out in 3 months.....	\$3.00 per ton.
From 100 to 1000 tons, drawn out in 3 months.....	1.00 "
For 1000 tons and more, drawn out in 3 months.....	5.00 "

ON SHEETS AND HOOPS.

All under 5 tons, full card rates.

For 5 tons and up to 3 tons.....	\$4.00 per ton.
Over 30 tons.....	6.00 "

This did not work well, and at a meeting held May 27th the following was adopted as a substitute: "Discounts for quantities bought within one calendar month from any one member of this Association shall be made at the end of the month, as maximum rates of discount as follows:

Less than 10 tons no discount.

On 10 tons and less than 30 tons.....	\$3.00 per ton discount
On 30 tons and less than 100 tons.....	4.00 "
On 100 tons and over.....	5.00 "

"When any purchaser of iron buys in any one calendar month 30 tons of iron, and less than 300, from one or more members of this association, he may be allowed an abatement of \$4 per ton; for 300 tons and over an abatement of \$5 per ton."

"Contracts for plate, sheet and hoop iron in specified quantities may be made for following amounts to be taken out in three months. Discounts may be allowed on such contracts at time of making invoice:

Under 5 tons no discount.

Over 5 tons.....	\$4.00 discount.
Over 30 tons.....	6.00 "

"These discounts were from the full card rates established in the different districts, and when deducted the figure remaining is the lowest selling time price for plate, sheet and hoop iron. The abatement for quantity on Merchant Iron must not be allowed in addition to above discounts."

There was trouble in sustaining these prices, as some manufacturers refused to join the Association, and shaded the price a fraction, which, of course, took the orders. So at a meeting held July 27th, in order to meet this, the following prices were established for Pittsburgh district:

Less than 10 tons..... 25 rates.

10 tons to 30 tons.....	25 rates.
Over 30 tons.....	25 rates.

In one order or drawn out in one calendar month.

At the same time, in order to correct certain evils, the members of the association, to meet competition by taking orders at such prices as will in their judgment secure such result: "Provided, that such price, to meet the competition above mentioned, shall not be less than 2c. card rates at Pittsburgh."

Notwithstanding the efforts to keep this confidential it soon leaked out and soon fell to 2c. In fact some mills were reported as quoting at less rates than these. Some orders have been taken as low as 1-10c.; but the best houses refuse to quote at less than 2c. The year closes with business very dull and unsatisfactory, orders scarce and small, and prices so close as to leave no margin for profit.

NAILS.

The Nail trade in the West has been the most satisfactory of all the branches of the iron trade, and the books will probably show a balance on the right side. This re-

sult is due to the formation of the Western Nail Association, which came into existence early in April, and which has since controlled prices.

It would be hard to say what Nails did not sell for early in the year. The price the first three weeks in January was ostensibly \$2-75, and declined the last week in the month to \$2-65, and the last week in February to \$2-60. The first week in March quotations were \$2-55 to \$2-60; the last of March and first week in April, \$2-50 to \$2-55, though some Nails sold for immediate delivery, as low as \$2-40. On the 7th of April the Western Nail Association was formed, and from that time the prices of Nails have been steady. The card rate was fixed at \$2-85, terms 60 days, or 2 per cent. off for cash if remitted within ten days from date of shipment, with an abatement of 10 cts. per keg in lots of 200 kegs and over at a single shipment, or if purchased and paid for, but the abatement not to be allowed unless on an absolute sale of 200 kegs, shipped in one lot or settled for. This is still the price from the mills.

The prices out of branch houses and agencies at various points, are at present as follows:

St. Louis.....	\$3.00
Cleveland.....	\$2.95
Detroit.....	\$3.01
Chicago.....	\$3.00
Toledo.....	\$3.03
Milwaukee.....	\$3.00
Cincinnati.....	\$2.95
Indianapolis.....	\$2.95
Louisville.....	\$2.92
Evansville.....	\$3.05
Nashville.....	\$3.10
Memphis.....	\$3.10

IRON ORE.

The ore producers of Lake Superior have, in many respects, reason to be satisfied with the course of their business during the past year. Prices have been well maintained, the shipments had been larger than in 1875, new markets have been opened, or old ones that had been quite small have been developed, and the incubus of charters for Lake freights, which has been so heavy in many cases during the past few years, has been entirely rolled off.

The price of the best Lake Superior specular ore has been \$6-50 to \$7 on the docks at Cleveland, according to brand, and though the shipments of all grades of ore up to the close of navigation had been 128,006 tons in excess of the shipments of 1875, for a corresponding period, it is asserted that all of the No. 1 ore and a large part of No. 2, and hematites have been sold at these and corresponding figures. This statement has been a subject of some surprise in view of the fact that so many furnaces were idle, and so much cinder was used at those blowing, but it is asserted that during the past year Lake Superior ore has been used at furnaces and in localities that have never used it before, or at least to no great extent. The Iron Mountain of Missouri has not been able to supply as much as heretofore, and this lack has been in some measure supplied by Lake ores. So that notwithstanding the many idle furnaces that have heretofore used Lake ores there are good reasons why the tonnage should be nearly as great as in 1875, when it reached 1,167,379 tons.

Just what the course of the market will be in 1877 is difficult to see. The use of native ores is increasing in Western Pennsylvania and Eastern Ohio, while some of the furnaces on the Ohio River have contracted already for some Virginia ores. Many furnaces are using a large percentage of cinder in the charge. Even furnaces running on Bessemer pig are doing this, all of which would indicate a decreased consumption. But then this cinder business must have an end. If the Western mills intend to keep up the quality of their manufactured product they will soon demand something better than the cinder stuff they are now using, and which must of a necessity grow worse with each return of the cinder to the stock pile.

Again, stocks of iron, as we show below, are so light that they may be regarded as virtually nothing. The least flurry in the pig iron market in Pittsburgh to-day would send it up in price and withdraw every ton of iron from the market. When these demands come, and they may come any moment, they may be delayed months—will be the ore producers' opportunity, and they will not be slow to avail themselves of it. Probably 1876 has seen the cheapest ore mining that ever will be done on Lake Superior. Every year is adding to the expense of working the first-class mines. In view of this, and the capital invested that will become idle or useless in case of stoppage, we do not see how the price of ore can be lower in 1877 than in 1876.

The yield for the past five years, and the price for No. 1 hard, on docks at Cleveland, have been as below:

Year.	Yield.	Price.
1872.....	922,055	
1873.....	1,167,379	\$13.00 to \$13.50
1874.....	935,458	8.50 to 9.00
1875.....	910,840	7.00 to 7.50
1876.....	1,085,000*	6.50 to 7.00

* Estimated.

Annual Review of the Metal Markets for 1876.

COPPER.

The year opened with a supply in the hands of the Calumet and Hecla Mining Company of 5,000,000 lbs. and in other hands of 7,000,000, making 12,000,000 lbs. in all. The product of the Lake Superior mines, from the close of navigation in 1875 to the same period of 1876, was 22,000,000; of other mines and smelting works, including those of Tennessee, Vermont and Baltimore, 19,000,000 lbs., constituting an aggregate supply of 53,000,000 lbs. We value the export at 17,000,000 lbs. Ingot Copper, in the shape of cartridges at 3,600,000 do., while home consumption may be put down as having reached 28,000,000 lbs., leaving at the end of this year's campaign a stock of but 5,000,000 lbs. Business in the Brass manufacturing regions has been unusually dull during the year, but there being a good export demand for Europe, the market has been relieved of undue pressure to sell, and a permanent low ruling of values has thus been prevented. The market in January opened at 23½c. here; Chili Bars at London at 28½, and Best Selected at 28½. The month remained quiet and steady, both here and

in Europe, our sales amounting to 1,000,000. English production from native ores in 1875 proved to have been but 4500 tons, against 10 years' average of 7337. Early in February the first large purchases for France and Germany were effected in this market, aggregating 8,000,000 lbs., at about 21c., to be delivered by installments at the way till midsummer, and there sold for consumption during the month 1,300,000 lbs., from 23½c. down to 22½c. London gave way to 27½ and 28½. In March the European markets weakened considerably, in consequence of heavier shipments from the West Coast and lighter ones to India, the fall in silver being the cause thereof; the figures reached were 27½ and 28½. Our own market, sluggish at first, revived toward the close; sales, 3,300,000 lbs. from 22½c. down to 22c. April found us with a scarcity of available Copper; prices were better sustained, but the demand remained moderate. Sales on the spot, 1,400,000 lbs. at 22½c. to 22c., and 5,000,000 June to August futures at 21c. In Europe great irregularity prevailed during the month, finally resulting in a general advance to 27½, 10 and 28½, the consumptive demand reviving. In May it became evident that our Brass manufacturers would take very little, and a feeling of great apathy spread, sales not exceeding 1,100,000 lbs. from 22½c. down to 21c. London remained steady. With the advent of warmer weather the stagnation in our own market increased in June, but 1,500,000 lbs. changing hands at 21c. to 19½c. Europe had also become quite dull once more, and the poor result of the Wallaroo sale precipitated a decline to 27½ and 28½. All speculation had subsided for the time being. Notwithstanding the extreme heat in July, there was a partial revival in our own market, when it transpired that some 5,000,000 lbs. had again been taken for Europe, yet the prostrate state of brass manufacture prevented a stable recovery. Sales for consumption, 1,200,000 lbs. from 19½c. to 20½c. At London speculation for a fall succeeded in depressing values to 27½ and 27c. In August consumers among us felt encouraged to come forward, and quite an extensive business was transacted, sales reaching 4,100,000 lbs. at from 20c. to 18½c. Soon after the great drop in Europe a more hopeful feeling began to manifest itself in the London market. Silver had recommenced to rise, and the wheels of trade with the extreme East were once more set in motion, while Valparaiso, from the same reason, shipped less Copper. London recovered to 27½ and 27c. At this time the powerful operation of the Bank of England to obtain the control of Chili Bars at the prevailing depressed rates, and in this endeavor they succeeded almost beyond precedent, thus engineering a vigorous rebound. Perceiving what was going on, the French government deemed the moment opportune to secure some 4,000,000 lbs. Lake Superior Copper in this market at something like 19c., whereupon our manufacturers also exhibited more readiness to operate, causing an advance to 21c. to 19½c. Sales, 1,800,000 lbs. at 20c. to 20½c. London improved to 27½ and 28½, winding up at 27½ and 28½. The stock of the Copper there was now greatly reduced with no early replenishment in prospect. Sales in December did not exceed 1,000,000 lbs. from 20½c. down to 19½c., manufacturers at the close of navigation receiving the last lots, bought some time previously to arrive, preparatory to closing the mills for the holidays, making their inventory and drawing up balance sheets, thus restricting transactions to a minimum. The production of Copper in England from native ores was, in 1875, 4322 tons, against 4981, 5340 and 5705 tons in 1874 to 1872, showing a slow but steady decrease.

TIN.

Although it is generally conceded that the enormous depreciation in the value of Tin has greatly stimulated consumption, production has been more than proportionate to the quantities absorbed, and any very material advance has thus been prevented. In April, 1872, Straits Tin touched £160. This year it declined to £70. 17, on the one hand, Tin has been more extensively used despite the prolonged industrial stagnation in both hemispheres, the Straits and Dutch East Indies together have not diminished their output, while Australia, on the whole, produces as much as ever. The production in 1875 was estimated at 35,643 tons, against 30,525, 27,258 and 25,644 in 1874, 1873 and 1872. The consumption in 1875 was 32,500 tons, against 27,000 in 1874. This year's figures from all quarters we shall only have in March next, but the present visible supply sufficiently indicates that the output has again been gaining on consumption. The recovery since May is therefore mainly due to speculation. Straits at London stood £81. 10/ on January 1, and here, 19½c., gold. Accounts were received from the Straits that the Perak rebellion had been successfully put down, and a decline to £79. 10/ ensued, while in a dull market we gave way to 18½c. The New York quotations are gold throughout, and for Straits Tin only. According to news from Batavia, Banca production was steady, turning out between 65,000 and 70,000 piculs, while that of Billiton, from 15,319 in 1866, had increased to 62,000 in 1875. In February, after recovering to £81. 10/, London precipitately declined to £77, the favorable result of the sale in Holland going for nothing in the face of large shipments from Australia. Our own market, though quiet, kept steady at 18½c. to 18c. The stock at London had increased 1000 tons during the two months. Arrivals here in March were excessive, and favorable winds causing quite a fleet to drop in at London, the Tin markets became demoralized, our own dropping to 16½c. London fluctuated between £74 and £72. 10/, steady at the latter figure. Australian shipments now began to diminish, and a firmer feeling manifested itself at London in April, notwithstanding the doubtful policy pursued by the Dutch Trading Society. After touching £73. 10/, London nevertheless recoiled to £71. 10/, while in this market a good consumptive demand developed, prices recovering to 16½c. to 17c. May was without any particular feature during the early part of the month, but toward its close our market recovered to 18½c., the visible supply at New York and Boston now running low, while a change in policy at the Dutch sale gave relief to the European situation, London recovering to £76. 10/, the auction in Holland being cleared at 45½ guilders, 29,300 slabs passing into private hands. In June a better feeling obtained in Europe, production in Australia having materially decreased since February. Our own market remained dull and weak, gradually yielding to 17c. to 17½c. In July the London market was placed into better shape, some Australian Tin being shipped thence to Holland, and many bankers investing spare funds in Tin on the spot. The Dutch sale, however, resulted in the low price of 43½ guilders, and London, from £74. 10/, declined to £73. Our own market remained quiet, and from 17½c. gave way to 17c., at which it closed strong. The business relations between Western Europe and the East had been all along much dis-

turbed and hampered, first, by the great decline in silver and subsequently its fluctuations. When it finally rose, Straits Tin cost 18c., laid down here, while not bringing over 16½c., remaining quiet during August and closing at 17c. London kept steady at £72. 10/. On taking stock in Holland in September it was found that some 500 tons Australian had accumulated. The Banca sale went at 42½ guilders, and London dropped to the lowest point, £70, while our own market, in spite of larger arrivals, was well supported at 17½c. to 17c. Notwithstanding the low price, the output in Cornwall was going on at the rate of 10,000 tons per annum. On the other hand, the disturbed exchanges in the East had seriously interfered with shipments from the Straits, both to Europe and America, and in view of a great drop at London speculators for a time were at length emboldened to concert a general movement in October, but temporarily checked by the war panic. Opening at £71. 10/, Straits was pushed to £74. 10/, then receded to £73 and closed at £74. We were tolerably firm here at 17c. to 17½c. Shipments from the Straits to Europe and America now showed a decrease of 21,000 piculs. In November, Eastern affairs, so far as England's danger of being involved was concerned, began to look less threatening, and the speculation in Tin was resumed with more vigor, resulting, after many fluctuations, in an advance to £75, our own market, with a reduced stock, more actively sympathizing with it and gradually raising the price from 17½c. to 18c. In December the market at first exhibited considerable strength, based upon the firmness of the London advances, but soon after a material recoil taking place there from £79 to £75. 10/, coinciding with large arrivals of Straits Tin here. The metal drifted into a drooping attitude, carrying Straits from 17½c. to 17c., at which it closed. The course of Tin was further unfavorably affected by the announcement that Australia had resumed shipments to Europe on an extensive scale, and would, in all likelihood, continue so for some indefinite time to come, not only from the main land, but also from Tasmania, where the deposits prove richer and more inexhaustible than in Australia proper. Added to this came news of the still troubled Eastern political outlook and its tendency to check speculation from an apprehension of tightening money markets, should actual war break out. The production of tin from native ores in England in 1875 was 9614 tons, against 9942, 9972 and 9560 tons in 1874 to 1872, a much slighter decrease than had been supposed. The revised London statistics showed that the Straits shipments to that port, including transshipments to New York, reached during the first 11 months of the year 7009 tons; that during the same period those from Australia to London amounted to 6071 tons, against 5701 in 1875, and that there were delivered to consumption in England 9707 tons, against 11,088 in 1875, while the United States took of all sorts, during the said period of 11 months, 3735 tons, against 3724 in 1875. According to Messrs. White & Haskell, of this city, we commenced the year with a stock in first hands on this coast of 350 tons, and imported from all quarters 4297 tons. The total supply was, therefore, 4647 tons, and we closed the year with a stock of 175 tons. The consumption was 4472 tons, against 4273 in 1875.

TIN PLATES.

There are few manufactured articles which have suffered as much from the protracted dullness in this country and elsewhere, as Tin Plates, notwithstanding the fact that they are comparatively little used for purposes of luxury. Nor has consumption been much stimulated by the extremely low figure to which they have been depressed. It has thus been a problem for makers when and to what extent to curtail production, and those among them on whom the strain of unprofitableness has been too heavy have had to succumb. Gradually, however, the adverse circumstances in operation seem to work their own cure. The decline in Plates in this market is best shown by the average value of the four kinds, ordinary brands, in gold, at various periods. On July 1, 1874, the average was still \$8-78, a year later it had declined to \$7-44, while during the present year it proves to have been about \$6-50. On the last of each month it stood as follows: January 1, 1876, \$7; Feb. 1, \$6-96; March 1, \$6-78; April 1, \$6-75; May 1, \$6-56; June 1, \$6-50; July 1, \$6-15; Aug. 1, \$6-64; Sept. 1, \$6-50; Oct. 1, \$6-40; Nov. 1, \$6-22; Dec. 1, \$6-25. The months of January and February were, as is usually the case, quiet, with an occasional briskening up in the jobbing demand, which became decidedly more active in March. In April a curtailment was resolved upon in England to the extent of some 250,000 boxes

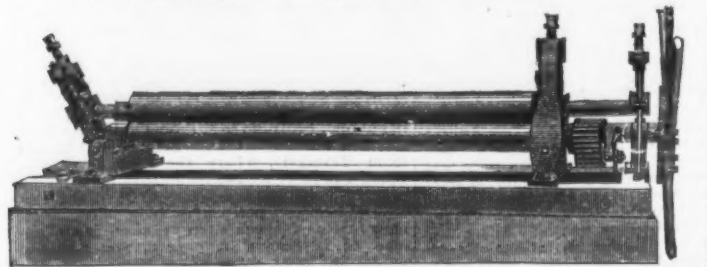
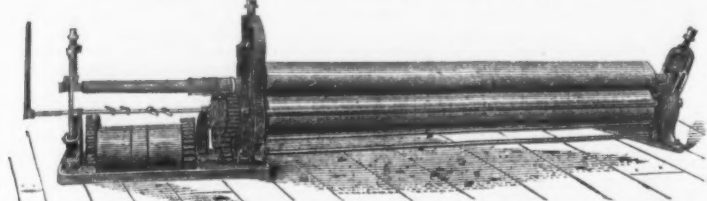
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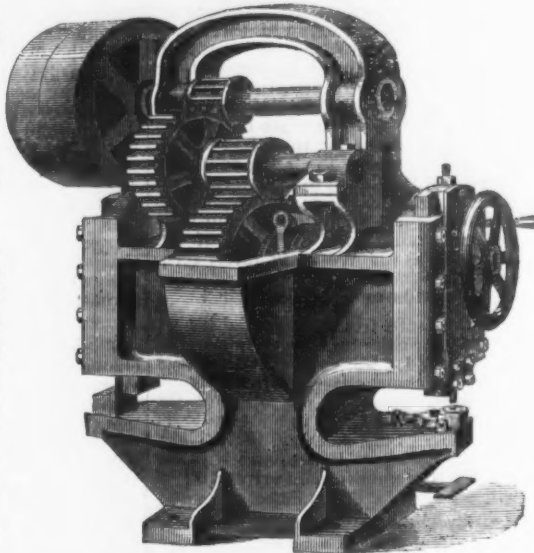
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Combined Punch & Shear.

Our regular pattern for boiler makers will punch and shear in the center of 40 inches, will punch $\frac{3}{4}$ inch hole in $\frac{3}{4}$ inch iron, and shear $\frac{3}{4}$ inch plate; is provided with an automatic stop motion for Punch "Head" that can be set by the operator to stop the punch at any point of the stroke, as for different thicknesses of iron the punch can be set to stop within $\frac{3}{4}$ of an inch of the iron after punching the hole, where it will rest until the work is adjusted for the next hole and the clutch thrown in. Is also provided with an adjustable stripper, a gauge and two "rests," one on each side of the die to support the work. Shears run while the belt is on the tight pulley, but the punch can be operated by the clutch. When desired, punch end of the machine is provided with heavy bolts, giving ten inches reach to center of punch, and will punch 1 inch hole in 1 inch iron. We also make this machine with 12 inches reach on punch end, to punch 1 inch hole in 1 inch iron, and with shears set on an angle for splitting sheets and cutting off bars.

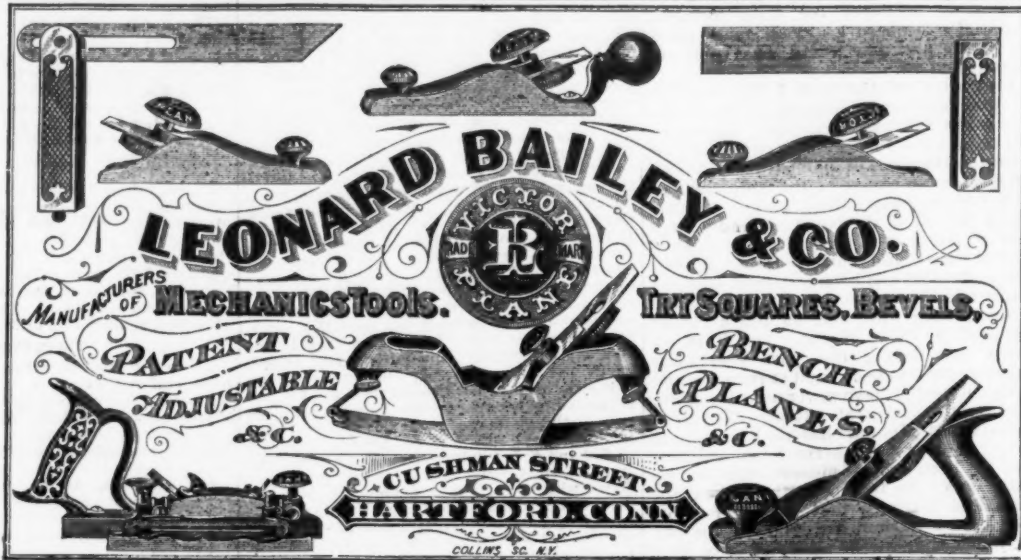
Our small pattern for boiler makers will punch 13-16 inch hole in $\frac{3}{4}$ inch iron, 15 inches from the edge, and shear $\frac{3}{4}$ inch plate 15 inches from the edge; is made for either hand or steam-power or both.



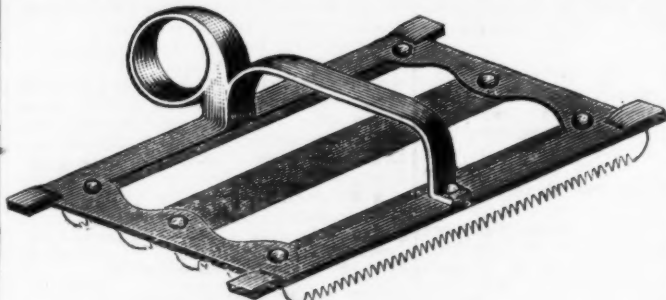
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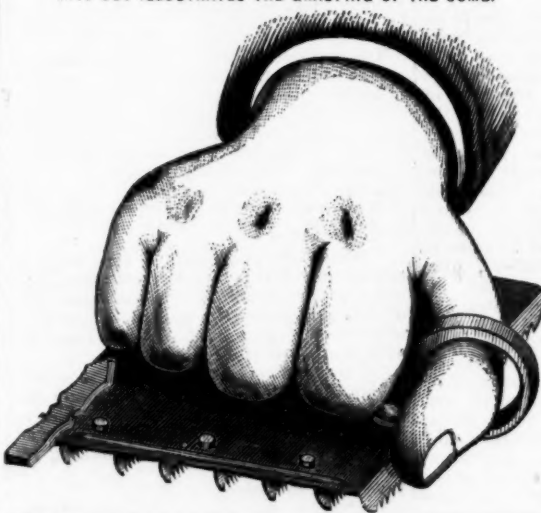
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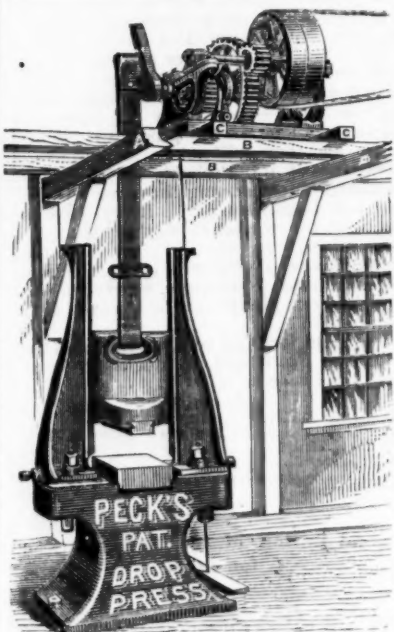
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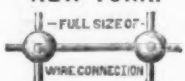
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Universally acknowledged superior to any other
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The very best as well as cheapest.

**Metallic Combination
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Made of solid cast steel end of gun metal. Of an
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Common Sense Door Spring.

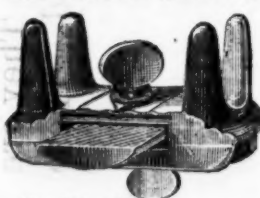
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To cut lead pipe in any position and without
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Please send for circulars and prices.

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Is just what has
long been wanted.
Every skater
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skates.
It does the work
complete on both
groove and flat
skates, without
the aid of a vise,
and is carried con-
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pocket. It sells
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Every skater buys
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IMPROVED
Gimlet Pointed Wood Screws,
Patented

May 30,

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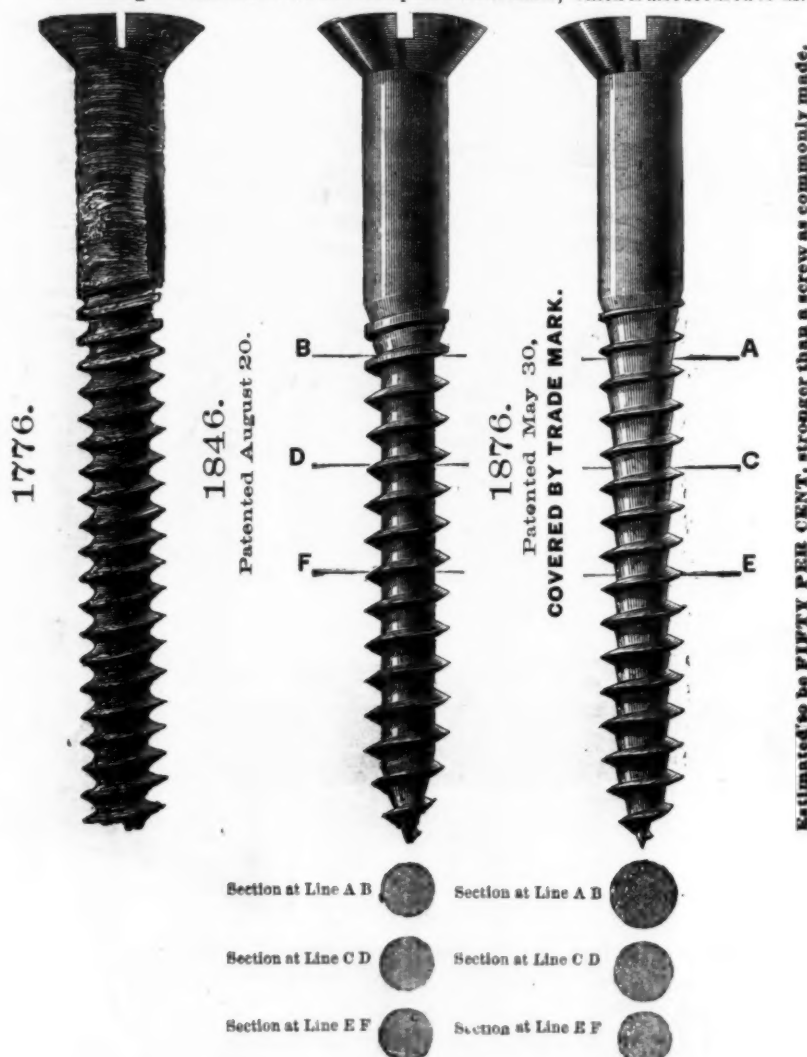


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ented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our
machinery as fast as possible, to manufacture the improved article only. To intro-
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The new screws will be packed in manila colored boxes with new label covering
end of box, and enlarged figures showing plainly contents.

To distinguish this screw we have adopted a trade mark, which is also secured to us.



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Experience has shown that the weak point of screws, as formerly made, is at the
heel of the thread, where all the strains of forcing the screw into the wood naturally
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To avoid the sharp angle existing in the old style of screws has been the aim of
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It will be seen in our new screw that not only is the sharp angle avoided, but
the strength very much increased, as illustrated above. See sections at lines.

CLAIM.

"A Pointed Wood Screw having the outer periphery of the thread upon its body
cylindrical, while a portion of the body below the thread and near the neck is conical,
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which constantly indicate without the use
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WATERS' IMPROVED
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Are made of best steel
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Light, practical, dura-
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Has no competitor
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Manufactured only in
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Manila Pails
REDUCED TO \$7.50 PER DOZ.

These goods we warrant not
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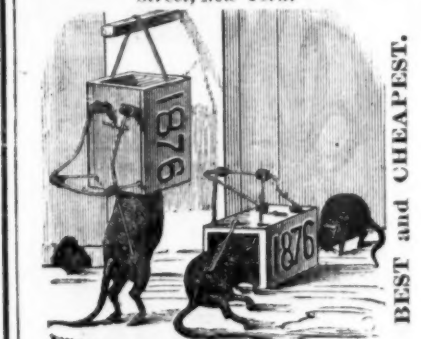
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Mailed prepaid on receipt of 50 cents.
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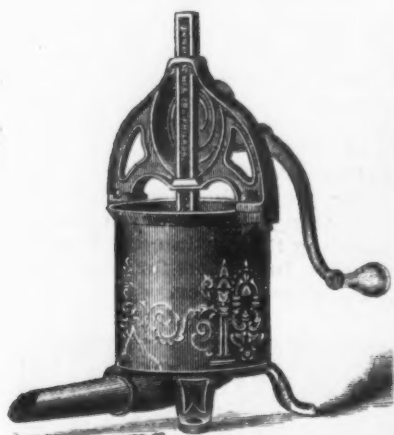
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GRANT & CO., Newark, N. J.
Cap Rifles & Targets.

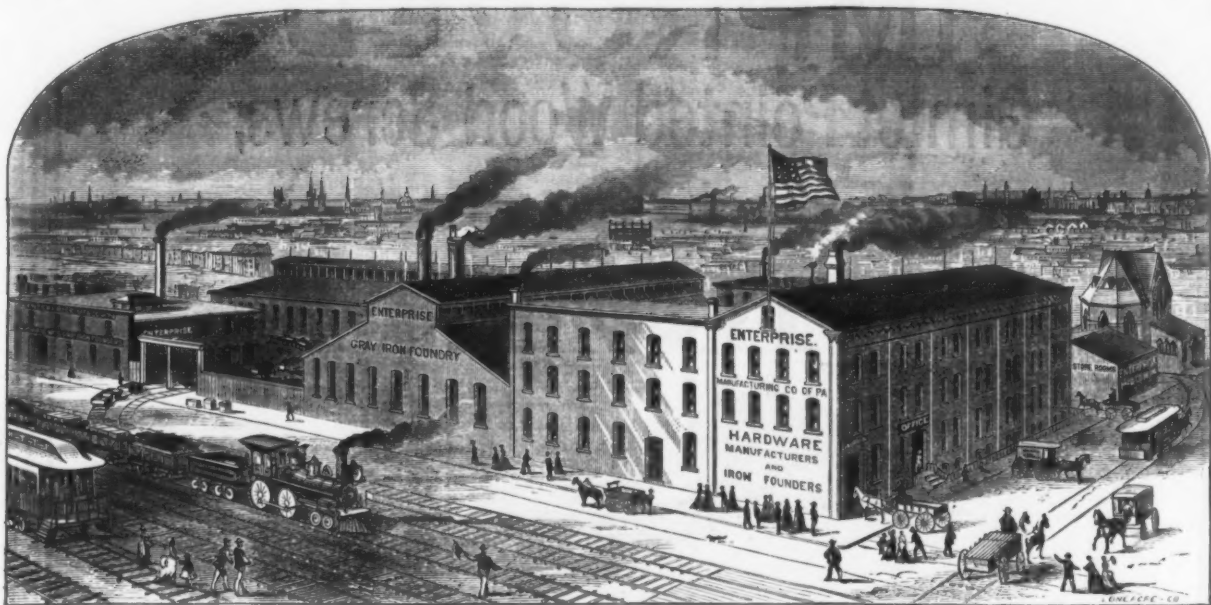
Works of ENTERPRISE MANUFACTURING CO. of PA.,

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PATENTED HARDWARE MANUFACTURERS.



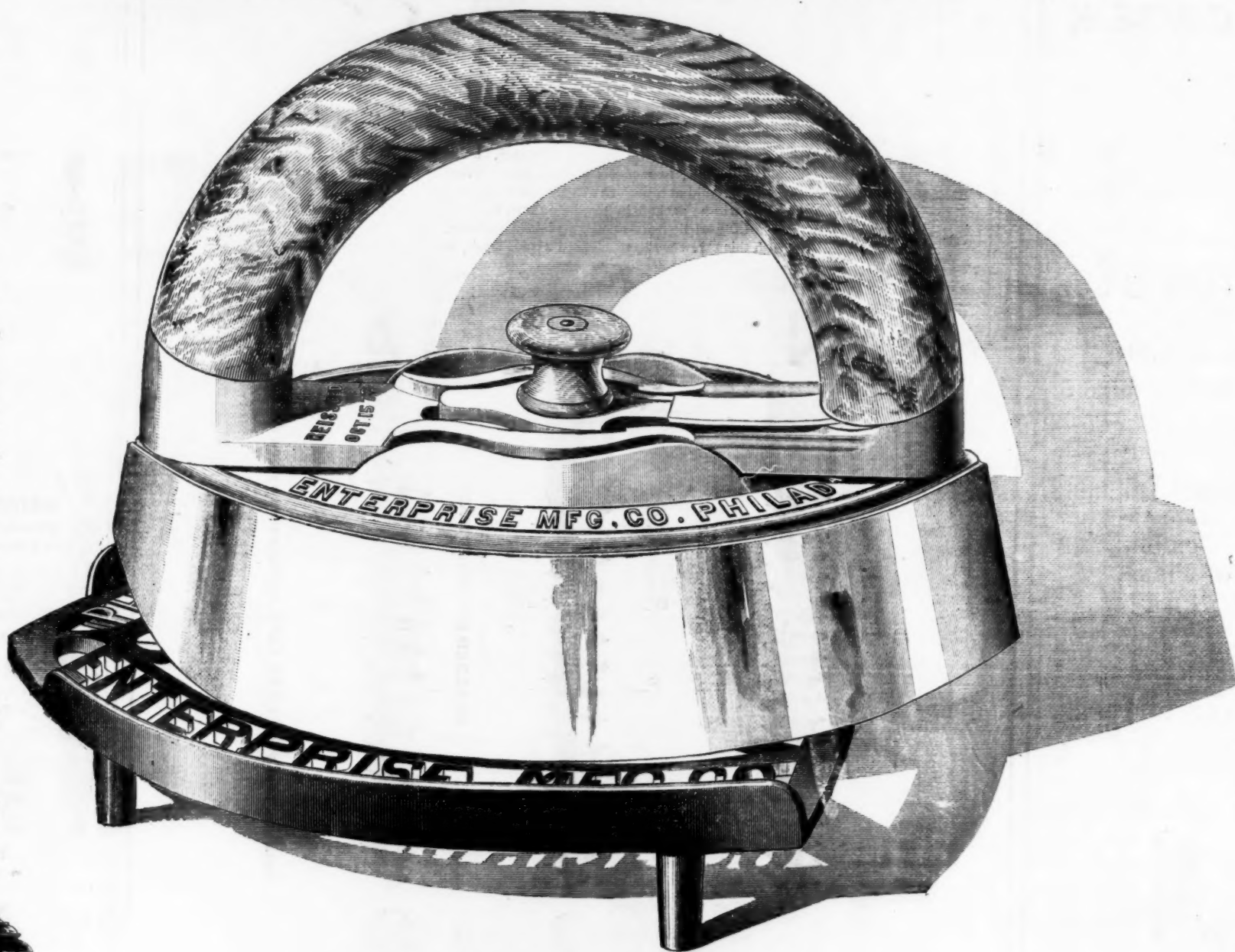
SAUSAGE STUFFER.—Closed.
Showing Sausage Stuffer, Fruit, Lard and Jelly Press closed.



SAUSAGE STUFFER.—Open.
Showing Sausage Stuffer, Fruit, Lard and Jelly Press open.

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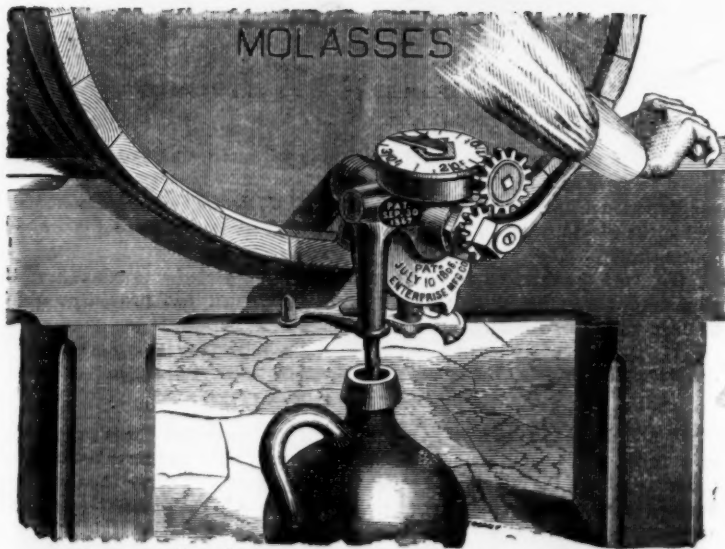
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Twenty different sizes, from \$2 to \$100 each.



Patent Suction and Force Measuring Faucet.
Warranted to measure correctly, and draw a gallon of the heaviest molasses in winter in one minute.



Self Weighing Cheese Knife and Cover.
Weighs and cuts the cheese at the same time—keeps it free from flies and dirt.

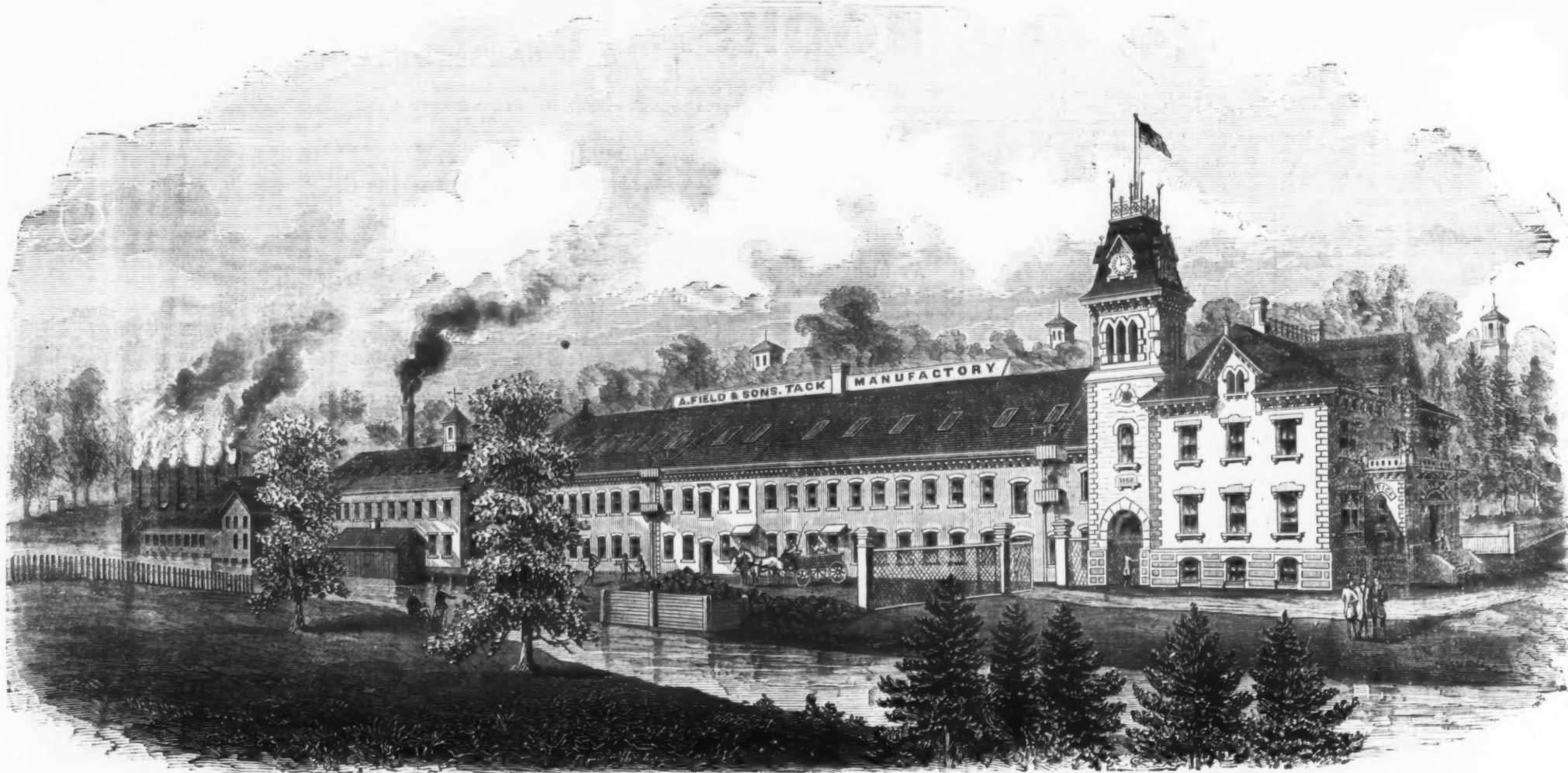
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Annual Review of the Metal Markets for 1876.

LEAD.

The influence at work in the Lead markets of the world have run widely apart. While an increased output in Europe and the United States during a period of continued stagnation in trade naturally tended to reduce values, events in Turkey and the East had the effect of keeping political matters in a continual ferment, compelling all the warlike nations to look to their supply of Lead and causing Russia in particular to import large amounts uninterruptedly. Europe of late years has been turning out 250,000 tons of Lead, on an average, and this year's increase of output may be put down at 10 per cent., constituting a total of about 280,000 tons. The precise quantity absorbed for war purposes this year is, of course, difficult to ascertain, but it is safe to estimate it at a figure exceeding the surplus production. Had the trade been active in Europe, and the demand for China brisk throughout, Lead, instead of rising 10 per cent., would not unlikely have appreciated 20 per cent., and more. In this country, where the demand alone has ruled the market, no favorable extraneous influences have come to assistance of the metal. Lead has lacked all buoyancy, and, as we have produced as much as in 1875, the consequence has been a steady decline, only arrested toward the close of the year by higher freights from the West. The year opened under less resumption of business at 5½¢, gold, for Common Domestic, and 7½¢, gold, Foreign, sales in January amounting to 550 tons, gradually rising to 6¢, gold. [All the ensuing quotations are gold, if not otherwise stated.] The stock held was under firm control and but moderate, and under the stimulus of a reviving demand prices soon displayed an upward turn, rising to 6½¢ in February; sales, 200 tons. In Europe the large advance of 10/20 in December was at first well sustained, but the markets weakened when the Carlist war terminated. Early in March the principal holder here had a stock of 1500 tons, while the government held 2500 tons, and there was little expected for several months to come. The position was, therefore, a strong one, provided the spring demand came up to expectations; but at this point a serious variance. Holders, nevertheless, deemed themselves justified in advancing the price, and between government and private sales some 600 tons changed hands at 6½¢ @ 6½¢. Soon after it became clear, however, that our spring trade would again prove a disappointment, and prices began to give way once more in April, sales reaching 400 tons at 6½¢ @ 6½¢. Heavy floods in Missouri had meanwhile retarded production in that quarter, while in Europe the spring opening was delayed from similar causes. Early in May prices had declined here to 6½¢ @ 6½¢, and some consumers and dealers deemed the opportunity a favorable one for replenishing supplies, some 3000 tons found purchasers in this market, on the spot and to arrive, at between 6½¢ @ 6½¢, and 6½¢ @ 6½¢, the government withdrawing as a seller for the time being, while in Europe the war demand revived somewhat. The general lowering of freights from the West at this time counteracted the maintenance of enhanced rates here, the government finally accepting 6½¢, and the general market from 6½¢, settling down to 6½¢ @ 6½¢. In all June, sales 350 tons. Europe continued to fluctuate according to the more or less warlike aspect. The receipts of Lead at St. Louis from Jan. 1 to June 24 proved to have been 288,422 pigs, against 236,307 in 1875. The extreme heat in July contributed not a little to spread a pall in this market, sales for the month amounting to 6½¢ @ 6½¢. Europe from a similar cause underwent a serious drop; Foreign Lead began to be pressed on our market at 6½¢ @ 6½¢. August opened with larger transactions, some 1750 tons changing hands on the basis of 6½¢ for Common Domestic, but the demand soon after subsiding, dullness once more settled upon the market, deepened by still lower offerings from Europe. The latter abruptly ceased in August, when Russia and France reappeared as heavy purchasers, causing a recovery there of 15/10. Our own market, with the prevailing low freight rates from the West, was now handed over more exclusively to the influence of Western offerings more or less pressing, carrying down prices by degrees to a low point. Sales in September, 250 tons, prices receding to 6½¢ @ 6½¢. The Western offerings thenceforward caused Domestic Lead to be quoted in currency, and we adopt the same accordingly for the remaining months of the year. In October it was discovered that in spite of the good demand for shot in some quarters, the fall trade would again prove a disappointment, subsequently heightened by the political squabbles growing out of the presidential election. Thus during the month there were not sold over 200 tons at 6½¢ @ 6½¢, a serious decline, while Foreign remained steady at 6½¢ @ 6½¢, gold. While we were thus descending in point of values to the lowest depths of our domestic Lead, the war excitement in Europe carried prices on the other side to the opposite extremes. In Russia prices ran up 20 per cent. in about a fortnight; in Western Europe about 10 per cent., and this in the face of a more liberal supply from Spain. At the depressed prices here more activity, however, developed in November, some 600 tons changing hands at 6½¢ @ 6½¢. According to the statistics of the English Mining Record Office, there were 304 lead mines in operation in England in 1875, producing 57,435 tons of Lead, against 58,777 in 1874. There were imported in that year 11,916 tons ore and 80,172 tons of Lead and manufactures thereof, against an export of 15,338 tons of Lead and its manufactures. In December activity greatly subsided in our own market, business in Lead being checked by the advance in freight rates from the West to the seaboard, which from 23¢, were gradually raised to 50¢, while for bullion, on the Union Pacific Railroad, an advance of 2¢ per ton was likewise asked. The market, therefore, closed irregular, holders demanding 6½¢ @ 6½¢, currency, for Common Domestic, and 6½¢ @ 6½¢, currency, for Selected. Stock of Domestic here, 800 tons; of Foreign, none. The latter closed nominally, 6½¢ @ 6½¢, gold.

SPELTER.

The production of Spelter has been making headway much more rapidly in this country than it has in Europe, where it took ten years to raise the same from 40,000 tons in 1846 to 71,000 in 1856 and the subsequent 16 years to bring it up to 129,000 in 1873, since when it has not expanded sufficiently to satisfy the rapidly increasing consumption. Here it was more than doubled between 1873 and 1875, rising from 7343 tons produced in 1873 to 13,823 tons in 1875, and when the figures for the current year shall have been obtained, we shall probably show another notable increase, while our consumption has not kept pace with it. The consequence has been that Europe has, on the whole, been quite active and steady, while here we have witnessed an almost chronic state of stagnation and a severe decline. The low price of the domestic article has finally driven the foreign one almost entirely out of the market. While competition from abroad thus gradually ceased, producers deemed it advisable to continue their combination and advance the price

by degrees, but a diminished consumption has frustrated these endeavors. The year opened quiet at 7½¢, currency, for Domestic, and 7½¢, gold, Silesian. The following quotations are currency for Domestic, and gold for Foreign. Accounts from Europe were favorable, large transactions taking place at Breslau, both on the spot and to arrive at improving rates. Early in January the combination felt encouraged to raise prices to 7½¢, at which Domestic remained inactive. In spite of the dullness the same parties advanced their selling price early in February to 7½¢, but outside lots simultaneously seeking purchasers at 7½¢ @ 7½¢, they gained little or nothing by this measure. Foreign had meanwhile sold steadily in moderate quantities at 7½¢ @ 7½¢, the price being raised to 7½¢, subsequently, in consequence of bareness of German markets. In March some animation developed in Domestic Spelter in anticipation of a further rising of prices, several parcels changing hands at 7½¢; but outside lots kept on offering a little below this, being obtainable at 7½¢ @ 7½¢. For a reduced supply of Foreign a higher figure was asked, but it soon settled down to 7½¢, upon weaker European advices. The combination on the approach of the spring trade established early in April the price at 8¢, but low offers of Common Silesian by cable, and an accumulated stock of a thousand tons Domestic at New York, counteracted this enhanced figure demanded, and consumers supplied themselves freely at 7½¢ @ 7½¢, from outside parties. Foreign meanwhile from 7½¢, declined to 7½¢. Although a good deal of activity ruled in Europe at the opening of navigation, prices there also gave way slightly, and Silesian declined to 7½¢, here. Accounts from our Brass regions at this time held out little encouragement, and the little required was easily obtained at 7½¢, for Domestic, thus carrying us to the month of June in a state of rather decreasing activity. It became evident to most people in the trade that the combination was a failure, the spring demand having failed to fulfill even the most modest expectations. Toward the close of June the price of Domestic suddenly broke down completely, it being offered from the West at 7½¢. At slightly lower figures a large business was meanwhile done at Breslau at prices laying Silesian down here at 7½¢, the price declining among us to 7½¢ @ 7½¢. In July our market became exceedingly flat, and gave way to 7½¢ @ 7½¢, nominally, for Domestic, and 7½¢ @ 7½¢, for Foreign, the decline in Europe being 10/10. In August, news reached us from the West that the stock in the hands of producers had decreased somewhat and was now under better control; the little required had therefore to be paid 7½¢. Similar intelligence being received from Europe, where unusually large purchases of Silesian were effected on the spot and to arrive, Foreign among us steadied at 7½¢ @ 7½¢. In September the stock of Domestic again commenced to accumulate at the West, and the fall demand proving a disappointment, the metal resumed a rapidly downward tendency. A dragging market carried the price from 7½¢ to 6½¢, while Foreign, with little transpiring therein, kept steady at 7½¢ @ 7½¢. In October the drooping attitude of the market found no relief, settling down to 6½¢ @ 6½¢, while with weaker advices from Europe Foreign gave way to 7¢. The political events in November were not calculated to restore confidence, and some Western makers began to manifest great anxiety to rid themselves of their accumulated supply, which they offered as low as 6½¢. Foreign remained steady at 7¢. In December greater discrimination began to be made between brands of Domestic make, the favorite well known ones selling readily at 6½¢, and inferior ones at 6½¢ @ 6½¢, while Foreign settled down to 6½¢ @ 6½¢, the closing figure. When the year was about coming to a close the advance freight rates, to which we have alluded in our Lead report, also somewhat unsettled the Spelter quotations, which holders on the seaboard were compelled to advance to 6½¢, for common brands, and 7¢, for superior quality, both currency. Business being stagnant, however, consumers hesitated in acceding to these enhanced figures, and the market closed nominal. The production of Spelter in England from native ores, in 1875, has been 6713 tons, against 4470, 4471 and 5191 in 1874-1875.

Special Notices.

NOTICE.

The public are cautioned against constructing, selling or using any Screw Machinery employing the inventions or improvements described in the following Letters Patent of the United States:

Letters Patent No. 42,786, for improvements in machinery for nicking the heads of wood screws, granted to H. A. Harvey, May 17th, 1864.

Letters Patent No. 43,766, for improvement in machinery for cutting thread upon wood and other screws, granted to H. A. Harvey, May 17th, 1864.

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AN EXPERIENCED HARDWARE MAN, WHO has traveled for many years, with best of references, wishes employment as clerk or bookkeeper. Address: Office of The Iron Age, 10 Warren St., N. Y.

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Importer & Dealer in HARDWARE,
Manufacturers' Agent, etc.
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REFERENCES:
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Van Wagoner & Williams, 83 Beekman St., N. Y.
T. Hoesenbruch & Co., 10 N. 5th St., Philadelphia.
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COPARTNERSHIP.—The undersigned will transact a commission business, as factors for the sale of American and foreign hardware, tools, &c., at 31 Beekman Street, under the firm name of J. Clark Wilson & Co.—New York, January 1, 1877.

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New and Second-Hand.

ENGINES:

32x72 in. Corlies Beam, 14x36 in. Woodruff & Beach Rev. 12x31 Green Cut-off, and six H. P. flasks, all in perfect order. Prices low.

PLANERS:

60 in. x 12 ft., 42 in. x 18 ft., 24 in. x 26 ft., 22 in. x 25 ft. Lathes, Milling Machines, Drills and Presses.

ALLIS, BULLARD & CO. (Limited),

14 Dey Street, New York.

Agricultural Implements

for export and the trade; largest stock always on hand ready to ship at notice. Manufacturer of **COMMON SENSE STALK CUTTER,** **VICTOR Corn Sheller, etc., etc.**

A. B. COMU, 197 Water Street,

"Everything for the Farm," containing illustrations of 30 of most improved Implements of Farm, sent on receipt of 1¢.

NOTICE! POND'S TOOLS.

The undersigned has assumed the Personal Property, including accounts, finished and unfinished Machinery, good will &c., connected with the manufacture of **MACHINIST'S TOOLS** as conducted by Mr. Lucius W. Pond since 1847, and will continue the said business at the old stand, cor. Union and Exchange Sts., Worcester, Mass., under the name of **DAVID W. POND, Successor to Lucius W. Pond.**

CARD.—Having assumed the business mentioned above, I solicit Inquiry and Patronage, with guarantee that present standard of Workmanship, and quality of Machinery shall be maintained. A large quantity of New and Second-Hand TOOLS, ALL STYLES AND SIZES, For Sale at Low Prices. Send for list of second-hand tools. Store at 98 Liberty St., New York, will be closed thence from Feb. 1, 1878, and all sales made from manufactory.

Respectfully, **DAVID W. POND,**

Successor to LUCIUS W. POND.

DISCOUNT LISTS.

Hinges (Stanley Works) list... 10¢ to 50¢ each. 15¢ and Butts, 1 Union Mfg. Co. 10¢ to 60¢. 15¢. Screws, Bolt, File Hinges and Butt Lugs—Contains all the lists and discounts that are used. Price, 8¢ 100.

Dayton & Lamberon, 97 Chambers St., N. Y.

VENTILATING & STEAM HEATING.

A thoroughly competent engineer, with extensive experience in the above line, desires employment.

Address **M.,**

Office of The Iron Age, 10 Warren St., N. Y.

MANUFACTURERS

desirous of introducing their goods to the British and Continental Markets, are advised to insert advertisements in the newspaper "IRON," published every Saturday, at 99 Cannon Street, London, E. C.

SCALE: First 3 lines, 8/; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

CONSUMES THE BLACK SMOKE.

Saves Coal, Saves Waste of Iron, and Consequently Saves Money.

Gilmore's Improved Double Gate Reverberatory Furnace

For Puddling, Boiling, Busselling or Reheating Iron. Its thorough efficiency apparent on examination. Two years' practical test proves it to be all that is claimed for it. Adds but little to first cost, or may be applied to old furnaces, and any furnaceman can work it without special instruction.

No prudent forge or mill management can afford to be without it.

Royalty, \$100 for each furnace per annum, or one-tenth of actual savings, as may be preferred by the user. Address

H. H. GILMORE, Patentee,
Supt. Boston Rolling Mills,
Cambridgeport, Mass.

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address, **IRON AND STEEL,**

Care of P. O. Box 813, Bridgeport, Conn.

American Manufactures in

England.

A merchant of long experience in Birmingham England, will devote time to the sale of, and to the procuring of, orders in the English market for American manufactures. For particulars apply to the Office of The Iron Age, 10 Warren St., N. Y.

SPECIAL NOTICE

A new style of **MEN'S SINGLE GUNS,** in addition to the former line of A. Simon's, Liege, now offered.

SILESIA SHEET ZINC, Imported by **LOUIS WINDMULLER & ROELKER,**

30 Reade Street, N. Y.

Steel Castings.

Solid and Homogeneous. Guaranteed tensile strength, 25 tons to square inch. An invaluable substitute for expensive forgings, or for Cast Iron requiring great strength. Send for circular and price list to **CHESTER STEEL CASTINGS CO.,**

Esplanade St., Philadelphia, Pa.

A. PURVES & SON,
Corner South & Penn Streets, Phila.,

Dealers in **Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry**

Facings. Best Quality Ingot Brass. Cash paid for all kinds of Metals and Tools.

The Champion Corrugated Ash Can. The best in the market for **ASHES, WASTE, OR GARBAGE.** Prices reduced. Large discount to dealers. Address, **THE CORRUGATED METAL CO.,** East Berlin, Conn.

Special Notices.

FOR SALE IN OHIO.

A nice, clean stock of Builders' Hardware, Stoves and House Furnishing Goods, connected with a good tin-shop in a growing city of 8000 inhabitants. Satisfactory reasons for selling. Address **P.,** Office of The Iron Age, 10 Warren St., N. Y.

Wanted,

A situation by a first-class hardware salesman, wholesale or retail. Address **H. B.,** Office of The Iron Age, 10 Warren St., N. Y.

DROP FORGINGS.

The Trenton View and Tool Works, Trenton, N. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings in quantities to order at reasonable rates.

HERMANN BOKER & CO., Proprietors, 101 & 103 Duane St., N. Y.

Ramsey's Car Truck

Shifting Apparatus.

The advantages gained by using Ramsey's Car Truck Shifting Apparatus, are as follows:

1st.—The power required to run a car on the level track is sufficient to separate the trucks from a car body.

2d.—It avoids twisting or straining the car frames.

3d.—The manufacturing cost of this Shifting Apparatus will not exceed one hundred dollars. And each one is capable of doing more work with less strain to the car, and without the assistance of an extra Steam Engine, than a Steam Hoist, costing twelve thousand dollars.

At each one of the principal stations where car wheels are regularly tested to see how they stand the journey, a switch is placed, having a depression or pit about eighteen inches deep, with gentle inclines at each end, and on each side a narrow track, remaining on the level, upon which is small but strong trucks, designed to carry supporting beams or cross-bars extending from one to the other across the pit, for the purpose of bearing the car body while the trucks run down the incline rails to the pit.

A Working Model of this Apparatus is on exhibition at

220 S. Fourth Street, Philadelphia, Pa.

Communications may be addressed to

RAMSEY & SCARLETT, as above, or to

Box 162, Cobourg, Ontario, Canada.

See The Iron Age of Sept. 7, 1876.

Briesen's Patent Agency

FOR SECURING INVENTIONS, TRADE MARKS, &c., IN AMERICA AND EUROPE.

No. 258 Broadway, New York.

A. V. BRIESEN.

Second-Hand & New

Machine Tools.

Three 21 inch swing "Pond" Drills. Three 4 Spindle Drills. One 5 ft. Radial Drill. One 2 Spindle Profiling Machine. Three Common Milling Machines. One No. 3 Smith & Gar

Trade Report.

Office of THE IRON AGE.
WEDNESDAY EVENING, Jan. 3, 1877.

The past week has been characterized by the usual holiday dullness in Wall street. Little of general interest has transpired in the various financial markets that our summary must, of necessity, be brief.

The local money market has been fairly steady, with 6 @ 7 per cent. as the rate to borrowers on call, and in some instances 7 per cent., gold. The discount rate on prime mercantile paper is 5 @ 7 per cent.

The gold market has been steady and without feature. The following will show the daily range of the premium:

	Highest.	Lowest.
Thursday.....	107 1/2	107
Friday.....	107 1/2	107
Saturday.....	107 1/2	107
Sunday.....	107 1/2	107
Monday.....	107 1/2	107 1/2
Tuesday.....	107 1/2	107 1/2
Wednesday.....	107 1/2	107 1/2

Government bonds have been dull and strong. Investment bonds generally are dull, but desirable railway mortgages have advanced owing to the increased confidence imparted by the wise policy of the roads in abandoning their cut-throat competition and agreeing upon a tariff of paying rates. We give below the closing quotations of U. S. securities.

The Stock Exchange has been very dull, and prices declined until Tuesday, when there was a slight reaction. The principal dealings have been in Lake Shore, D. L. & W., Erie, N. Y. Central, Michigan Central, Western Union, Rock Island and N. J. Central. We give below the quotations of shares on the active list at the close of business to-day.

The bank statement shows an increase of \$4,818,100 in total reserve and \$3,245,000 in surplus reserve, the latter now standing at \$14,500,525. The specie average of the banks is now up to \$33,049,703, or within \$1,025,400 of the legal tender note average. It would be a matter for congratulation if the large amount of specie now in New York could be retained here, as the gold here is the reservoir from which the Treasury must draw in its preparation for resumption. The following is a comparison of the bank averages for the past two weeks:

	Dec. 23.	Dec. 30.	Differences.
Loans.....	\$32,684,000	\$33,328,600	Inc. \$644,600
Specie.....	32,629,900	33,049,703	Inc. 419,803
Local funds.....	35,446,900	34,575,100	Dec. 871,800
Deposits.....	30,170,700	31,261,100	Inc. 1,090,400
Circulation.....	15,137,800	15,268,700	Inc. 130,900

The movements in foreign trade for the week are shown in the following tables:

For the week ended Dec. 30:

	1876.	1875.	1876.
Total for week.....	\$4,971,137	\$4,529,960	\$4,038,572
Prev. reported.....	\$38,355,233	\$39,007,704	\$37,496,079

Since Jan. 1.....\$38,355,233 323,537,664 278,531,651

Among the imports of general merchandise were articles valued as follows:

	Quant.	Value.
Anvils.....	138	1,000
Brass goods.....	3	445
Bronzes.....	12	1,841
Chains and Anchors.....	49	1,994
Cutlery.....	9	15,868
Gunpowder.....	9	1,323
Hardware.....	18	1,413
Iron, pig, tons.....	123	4,788
Iron, tubs.....	230	562
Iron, other, tons.....	34	1,676
Lead, pigs.....	10,272	10,272
Metal goods.....	70	8,296
Nails.....	1	146
Needles.....	10	4,448
Nickel.....	1	1,819
Old metal.....	1	883
Platina.....	1	5,297
Steel.....	361	5,802
Silverware.....	2	425
Tin, boxes.....	6,845	8,174
Tin, bbls.....	30	1,211
Wire.....	2	848

EXPORTS EXCLUSIVE OF SPECIE.

For the week ended Jan. 2:

	1875.	1876.	1877.
Total for week.....	\$4,249,339	\$4,012,323	\$6,958,910
Previously reported.....			\$3,573,070

Total since Jan. 1, 1876.....\$43,843,476

Same time in 1875.....\$39,510,776

Same time in 1874.....\$48,659,661

Same time in 1873.....\$1,959,042

Government bonds at the close were strong at the following quotations:

	Bid.	Asked.
U. S. Currency 6s.....	121 1/2	122
U. S. 6s, 1881, reg.....	113 1/2	114
U. S. 6s, 1881, con.....	113 1/2	114
U. S. 6s, 1880, reg.....	109 1/2	110
U. S. 6s, 1880, con.....	109 1/2	110
U. S. 6s, 1879, new reg.....	110 1/2	111
U. S. 6s, 1879, con.....	110 1/2	111
U. S. 6s, 1877, reg.....	113 1/2	114
U. S. 6s, 1877, con.....	113 1/2	114
U. S. 6s, 1876, con.....	113 1/2	114
U. S. 6s, 1876, reg.....	113 1/2	114
U. S. 10-40 reg.....	113 1/2	114
U. S. 10-40 con.....	113 1/2	114
U. S. 10-40, 1881, reg.....	111 1/2	112
U. S. 10-40, 1881, con.....	111 1/2	112
U. S. 4 1/2s, 1891, reg.....	106 1/2	107

The following are the closing quotations of active shares:

	Bid.	Asked.
Atlantic and Pacific Telegraph.....	154	156
Chicago & Northwestern.....	36 1/2	37
Chicago, Rock Island and Pacific.....	100 1/2	101
Chic. & N. Y. & Ind. C. & P.....	116 1/2	117
Chic. & Ind. C. & P.....	94	95
Clev. Col. C. & Ind. P.....	38	40
Cleveland and Pittsburgh.....	89 1/2	90
Chicago & Alton.....	99	100
Consolidation Coal.....	109	110
Canton.....	54	55
Del. Lack. and Western.....	76 1/2	77
Delaware and Hudson Canal.....	73 1/2	74
Adams Express.....	101	102
American Express.....	56	57
United States Express.....	55	56
Wells, Fargo & Co. Express.....	89	90
Erie.....	35 1/2	36
Hartford.....	137	138
Hannibal & St. Joseph.....	13	14
Illinois Central.....	63	64
Lake Shore.....	62 1/2	63
Michigan Central.....	47 1/2	48
Morris & Essex.....	91 1/2	92
Milwaukee & St. Paul.....	20 1/2	21
Mariposa.....	63	64
New York Central.....	100 1/2	101
New Jersey Central.....	96 1/2	97
Ohio & Mississippi.....	11	12
Pacific Mail.....	23 1/2	24
Panama.....	136	137
Pittsburgh & Fort Wayne.....	100 1/2	101
Quicksilver.....	19 1/2	20
St. L., Kan. City Northern.....	4 1/2	5
Tol. Wabash & Western.....	25 1/2	26
Union Pacific.....	61	62
Western Union Telegraph.....	73 1/2	74

GENERAL HARDWARE.

As might be expected there is little or nothing doing in the way of selling goods, but from the following reports it will be seen that manufacturers are revising their prices and getting ready for spring business. With few exceptions all of the changes are in the direction of lower prices.

The demand for Nails is light, and prices remain as before. We quote 10L to 60L \$3.00 net, per keg, with the usual allowance of 10 cents per keg for lots of 100 kegs and over.

Henry Diston & Sons have issued the following discount sheet under date of 1st instant. By reference to their list it will be seen that the discount off Hand and Panel Saws, &c., Cross-cuts, Billet Webs, Framed Wood Saws, Butcher Saws, Plastering and Brick Trowels, and kindred goods, has been changed from discount 15 to discount 20 per cent. The discount off Mill, Mulay and Pit Saws is 30 per cent. instead of 25 per cent. as formerly. They are now making a full assortment of Files which they quote at discount 30 per cent. from their list:

Page No.	Per Cent.	Factory Rates.
9, Circular Saws, from 4 to 46, inclusive.....	25	30
9, Circular Saws, 48 in. and larger.....	30	30
10, Segment Saws.....	25	30
10, Shingle Saws.....	25	30
10, Repairing Saws.....	25	30
11, Concave Saws.....	20	30
12 to 26, inclusive.....	20	30
27 to 30 ".....	30	30
31 to 65 ".....	30	30
66 to 67 ".....	30	30
68, 69, 70, inclusive.....	30	30
71 to 73 " (excepting Saw Saws).....	30	30
73, Saw Saws.....	20	30
74 to 75, inclusive.....	30	30
76 to 79 ".....	15	30
80, Files.....	30	30

The above are factory rates for the coming season, and bills unpaid by the 20th proximo will be drawn for at sight, and, if not honored, an interest of 10 per cent. will be charged from the first of the succeeding months.

HENRY DISTON & SONS.

January 1, 1877.

We have also received the following:

PHILADELPHIA, January 1st, 1876.

To the Hardware Trade: We invite the attention of the trade to the reduction we have made in the price of our Saws. All the trade are aware that we have always adhered to the policy of firm prices, preferring if possible to improve the quality of our goods rather than reduce the cost. Acknowledging the necessities of the times, we have placed our Saws at such a price that mechanics can purchase tools of our manufacture at figures more in keeping with the present low rates of wages. We shall in the future as in the past maintain for our goods the same high standard of excellence, both as regards quality and finish which has gained for us the popular favor of which we are justly proud.

We hope that the Hardware trade will reap some advantage from these reduced figures, as we are not forgetful of the generous assistance they have given us, both in the introduction of our goods at a time when American-made Saws were an experiment and since our reputation has been established in aiding us to meet foreign competition.

We shall, as in the past, freely exchange any saw of our brand that may prove faulty. Hoping for a continuance of your favors, we are,

Yours truly,

HENRY DISTON & SONS.

The American Screw Company has issued, under date of the 1st instant, the following circulars, from which it will be seen that they have reduced the price on Flat Head Iron Wood Screws to discount 60 per cent. which is extremely low, compared with the prices to which the trade have been accustomed. As a matter of history, previous to the introduction of their Patent Gimlet Pointed Screws, nearly thirty years ago, and during a period of great prostration in the Screw business, first quality Blunt Screws sold at 60 per cent. discount, and second quality at 65 per cent. This was at a time when labor and material were very much lower than at present. These facts, coupled with the stopping of several small manufacturers, would seem to indicate that present prices are very low. It will be noticed that the American Screw Company now offer regular Iron Machine Screws, for the production of which their facilities are now very complete at reduced prices, and have adopted the same price list for these goods as is used for Wood Screws, instead of the list formerly used. The form in which this circular has been issued is by far the most elegant and artistic we have ever seen in a trade document. It is illustrated by beautiful steel plate engravings of their Eagle and New England Mills, their trade-mark, and of three screws made respectively in 1776, 1846 and their new patent of 1876, which has been already fully described by us.

PROVIDENCE, January 1, 1877.

To the Hardware Trade: Having reduced the price of our Gimlet Pointed Wood Screws and Machine Screws, we quote you the following discounts and terms:

For Home Trade.

	Discount from American List.
Flat Head Iron Wood Screws.....	60%
Flat Head Brass ".....	55%
Round Head Iron ".....	50%
Round Head Brass ".....	40%
Steel Bolts.....	50%
Tie Bolts, best quality.....	70%
Iron Black, Iron Tinned and Black and Carriage Rivets in Bulk.....	65%
Rivets in Bulk.....	50%
Coach Screws.....	50%
Flat Head Iron Machine Screws, from Stock.....	50%
Round Head Iron Machine Screws, from Stock.....	50%
Terms, cash, within 30 days from date of invoice. Payments in funds at par in Boston, New York, Philadelphia or Baltimore.	

For Export Trade.

Special prices and terms will be given upon application.

We are now making most of the leading sizes of our New Patent Screws, estimated to be 50 per cent. stronger than Screws as formerly made.

Soliciting your orders and wishing you the compliments of the season, we remain,

Yours, very respectfully,

AMERICAN SCREW CO.

PROVIDENCE, R. I., Jan. 1, 1877.

To the Hardware Trade: Our mill and machinery for making machine Screws in large

quantities being completed, we are enabled to offer the regular Iron Machine Screws, which we keep constantly in stock of lengths, sizes and threads as per annexed list, at greatly reduced prices, and in place of the special Machine Screw price list previously used we have adopted the same price list for these Machine Screws as is now used for Wood Screws, and our present quotations are:

Flat Head Iron Machine Screws, 10 per cent. discount; Round Head Iron Machine Screws, list net; Taps for Machine Screws, 35% per cent. Terms, cash within 30 days from date of invoice. Machine Screws varying from the annexed list in length, size or thread, will be made to order at special prices.

We desire to call the attention of parties interested—

To our improved method of manufacturing these Screws; the thread of the Screw being cut with a solid die, and all made to regular standard sizes, the various kinds being respectively of uniform size and style, with a view to meet the requirements for Screws used in metals in the same economical and convenient manner as is met the requirements for Screws used in wood.

To the variety of lengths, sizes, threads of Flat and Round Head Machine Screws, which we constantly keep in stock as per price list herewith.

To the Taps of best steel made expressly for use with our Machine Screws.

To the convenience with which our Machine Screws and Taps may be obtained, they being kept in stock and for sale by various parties in different cities.

Your orders are respectfully solicited and will have our prompt attention.

AMERICAN SCREW CO.

Price List of Iron Machine Screws—Per Gross.

Inch	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
3/8	21	26	31	37	43	48	54	60	66
1/2	21	26	31	37	43	48	54	60	66
5/8		29	33	37	43	48	54	60	66
3/4		30	34	38	43	48	54	60	66
7/8			35	41	46	51	56	61	66
1			37	43	48	53	58	64	69
1 1/8				50	56	61	66	71	76
1 1/4					58	64	70	76	81
1 1/2						70	76	81	86

Memorize Nos. made to order. Differing in length.

Bronze Metal Goods.

Door Locks, Latches, &c.

No.	Old Price.	New Price.	Page in 1876.
No. 1038.	\$105.00	\$97.00	282
No. 1040.	120.00	112.00	292
No. 1042.	75.00	70.00	293
No. 1044.	60.00	55.00	293
No. 1046.	18.00	15.25	306
No. 1048.	39.00	32.75	307
No. 1050.	16.80	15.50	320
No. 1052.	27.00	21.75	303
No. 1054.	21.00	16.25	305
No. 1056.	33.00	27.75	303
No. 1058.	33.00	27.75	317
No. 1060.	8.50	7.75	315
No. 1062.	7.00	6.25	316
No. 1064.	10.00	9.25	314
No. 1066.	16.80	14.25	320
No. 1068.	16.80	14.25	320
No. 1070.	7.20	6.25	319
No. 1072.	93.00	85.00	284
No. 1074.	108.00	100.00	284
No. 1076.	42.00	38.00	291
No. 1078.	54.00	48.00	291
No. 1080.	69.00	63.00	295
No. 1082.	57.00	51.00	295
No. 1084.	63.00	57.00	295
No. 1086.	75.00	69.00	298
No. 1088.	10.80	9.25	318
No. 1090.	13.20	11.75	318
No. 1092.	13.80	12.25	318
No. 1094.	16.20	14.75	318
No. 1096.	16.80	15.25	318
No. 1098.	19.20	17.75	318
No. 1100.	105.00	97.00	282
No. 1102.	120.00	112.00	292
No. 1104.	75.00	70.00	293
No. 1106.	60.00	55.00	293
No. 1108.	18.00	15.25	306
No. 1110.	39.00	32.75	307
No. 1112.	16.80	15.50	320
No. 1114.	27.00	21.75	303
No. 1116.	21.00	16.25	305
No. 1118.	33.00	27.75	303
No. 1120.	33.00	27.75	317
No. 1122.	8.50	7.75	315
No. 1124.	7.00	6.25	316
No. 1126.	10.00	9.25	314
No. 1128.	16.80	14.25	320
No. 1130.	16.80	14.25	320
No. 1132.	7.20	6.25	319
No. 1134.	93.00	85.00	284
No. 1136.	108.00	100.00	284
No. 1138.	42.00	38.00	291
No. 1140.	54.00	48.00	291
No. 1142.	69.00	63.00	295
No. 1144.	57.00	51.00	295
No. 1146.	63.00	57.00	295
No. 1148.	75.00	69.00	298
No. 1150.	10.80	9.25	318
No. 1152.	13.20	11.75	318
No. 1154.	13.80	12.25	318
No. 1156.	16.20	14.75	318
No. 1158.	16.80	15.25	318
No. 1160.	19.20	17.75	318
No. 1162.	105.00	97.00	282
No. 1164.	120.00	112.00	292
No. 1166.	75.00	70.00	293
No. 1168.	60.00	55.00	293
No. 1170.	18.00	15.25	306
No. 1172.	39.00	32.75	307
No. 1174.	16.80	15.50	320
No. 1176.	27.00	21.75	303
No. 1178.	21.00	16.25	305
No. 1180.	33.00	27.75	303
No. 1182.	33.00	27.75	317
No. 1184.	8.50	7.75	315
No. 1186.	7.00	6.25	316
No. 1188.	10.00	9.25	314
No. 1190.	16.80	14.25	320
No. 1192.	16.80	14.25	320
No. 1194.	7.20	6.25	319
No. 1196.	93.00	85.00	284
No. 1198.	108.00	100.00	284
No. 1200.	42.00	38.00	291
No. 1202.	54.00	48.00	291
No. 1204.	69.00	63.00	295
No. 1206.	57.00	51.00	295
No. 1208.	63.00	57.00	295
No. 1210.	75.00	69.00	298
No. 1212.	10.80	9.25	318
No. 1214.	13.20	11.75	318
No. 1216.	13.80	12.25	318
No. 1218.	16.20	14.75	318
No. 1220.	16.80	15.25	318
No. 1222.	19.20	17.75	318
No. 1224.	105.00	97.00	282
No. 1226.	120.00	112.00	292
No. 1228.	75.00	70.00	293
No. 1230.	60.00	55.00	293
No. 1232.	18.00	15.25	306
No. 1234.	39.00	32.75	307
No. 1236.	16.80	15.50	320
No. 1238.	27.00	21.75	303
No. 1240.	21.00	16.25	305
No. 1242.	33.00	27.75	303
No. 1244.	33.00	27.75	317
No. 1246.	8.50	7.75	315
No. 1248.	7.00	6.25	316
No. 1250.	10.00	9.25	314
No. 1252.	16.80	14.25	320
No. 1254.	16.80	14.25	320
No. 1256.	7.20	6.25	319
No. 1258.	93.00	85.00	284
No. 1260.	108.00	100.00	284
No. 1262.	42.00	38.00	291
No. 1264.	54.00	48.00	291
No. 1266.	69.00	63.00	295
No. 1268.	57.00	51.00	295
No. 1270.	63.00	57.00	295
No. 1272.	75.00	69.00	298
No. 1274.	10.80	9.25	318
No. 1276.	13.20	11.75	318
No. 1278.	13.80	12.25	318
No. 1280.	16.20	14.75	318
No. 1282.	16.80	15.25	318
No. 1284.	19.20	17.75	318
No. 1286.	105.00	97.00	282
No. 1288.	120.00	112.00	292
No. 1290.	75.00	70.00	293
No. 1292.	60.00	55.00	293
No. 1294.	18.00	15.25	306
No. 1296.	39.00	32.75	307
No. 1298.	16.80	15.50	320
No. 1300.	27.00	21.75	303
No. 1302.	21.00	16.25	305
No. 1304.	33.00	27.75	303
No. 1306.	33.00	27.75	317
No. 1308.	8.50	7.75	315
No. 1310.	7.00	6.25	316
No. 1312.	10.00	9.25	314
No. 1314.	16.80	14.25	320
No. 1316.	16.80	14.25	320
No. 1318.	7.20	6.25	319
No. 1320.	93.00	85.00	284
No. 1322.	108.00	100.00	284
No. 1324.	42.00	38.00	291
No. 1326.	54.00	48.00	291
No. 1328.	69.00	63.00	295
No. 1330.	57.00	51.00	295
No. 1332.	63.00	57.00	295
No. 1334.	75.00	69.00	298
No. 1336.	10.80	9.25	318
No. 1338.	13.20	11.75	318
No. 1340.	13.80	12.25	318
No. 1342.	16.20	14.75	318
No. 1344.	16.80	15.25	318
No. 1346.	19.20	17.75	318
No. 1348.	105.00	97.00	282
No. 1350.	120.00	112.00	292
No. 1352.	75.00	70.00	293
No. 1354.	60.00	55.00	293
No. 1356.	18.00	15.25	306
No. 1358.	39.00	32.75	307
No. 1360.	16.80	15.50	320
No. 1362.	27.00	21.75	303
No. 1364.	21.00	16.25	305
No. 1366.	33.00	27.75	303
No. 1368.	33.00	27.75	317
No. 1370.	8.50	7.75	315
No. 1372.	7.00	6.25	316
No. 1374.	10.00	9.25	314
No. 1376.	16.80	14.25	320
No. 1378.	16.80	14.25	320
No. 1380.	7.20	6.25	319
No. 1382.	93.00	85.00	284
No. 1384.	108.00	100.00	284
No. 1386.	42.00	38.00	291
No. 1388.	54.00	48.00	291
No. 1390.	69.00	63.00	295
No. 1392.	57.00	51.00	295
No. 1394.	63.00	57.00	295
No. 1396.	75.00	69.00	298
No. 1398.	10.80	9.25	318
No. 1400.	13.20	11.75	318
No. 1402.	13.80	12.25	318
No. 1404.	16.20	14.75	318
No. 1406.	16.80	15.25	318
No. 1408.	19.20	17.75	318
No. 1410.	105.00	97.00	282
No. 1412.	120.00	112.00	292
No. 1414.	75.00	70.00	293
No. 1416.	60.00	55.00	293
No. 1418.	18.00	15.25	306
No. 1420.	39.00	32.75	307
No. 1422.	16.80	15.50	320
No. 1424.	27.00	21.75	303
No. 1426.	21.00	16.25	305
No. 1428.	33.00	27.75	303
No. 1430.	33.00	27.75	317
No. 1432.	8.50	7.75	315
No. 1434.	7.00	6.25	316
No. 1436.	10.00	9.25	314
No. 1438.	16.80	14.25	320
No. 1440.	16.80	14.25	320
No. 1442.	7.20	6.25	319
No. 1444.	93.00	85.00	284
No. 1446.	108.00	100.00	284
No. 1448.	42.00	38.00	291
No. 1450.	54.00	48.00	291
No. 1452.	69.00	63.00	295
No. 1454.	57.00	51.00	295
No. 1456.	63.00	57.00	295
No. 1458.	75.00	69.00	298
No. 1460.	10.80	9.25	318
No. 1462.	13.20	11.75	318
No. 1464.	13.80	12.25	318
No. 1466.	16.20	14.75	318
No. 1468.	16.80	15.25	318
No. 1470.	19.20	17.75	318
No. 1472.	105.00	97.00	282
No. 1474.	120.00	112.00	292
No. 1476.	75.00	70.00	293
No. 1478.	60.00	55.00	293
No. 1480.	18.00	15.25	306
No. 1482.	39.00	32.75	307
No. 1484.	16.80	15.50	320
No. 1486.	27.00	21.75	303
No. 1488.	21.00	16.25	305
No. 1490.	33.00	27.75	303
No. 1492.	33.00	27.75	317
No. 1494.	8.50	7.75	315
No. 1496.	7.00	6.25	316
No. 1498.	10.00	9.25	314
No. 1500.	16.80	14.25	320
No. 1502.	16.80	14.25	320
No. 1504.	7.20	6.25	319
No. 1506.	93.00	85.00	284
No. 1508.	108.00	100.00	284
No. 1510.	42.00	38.00	291
No. 1512.	54.00	48.00	291
No. 1514.	69.00	63.00	295
No. 1516.	57.00	51.00	295
No. 1518.	63.00	57.00	295
No. 1520.	75.00	69.00	298
No. 1522.	10.80	9.25	318
No. 1524.	13.20	11.75	318
No. 1526.	13.80	12.25	318
No. 1528.	16.20	14.75	318
No. 1530.	16.80	15.25	318
No. 1532.	19.20	17.75	318
No. 1534.	105.00	97.00	282
No. 1536.	120.00	112.00	292
No. 1538.	75.00	70.00	293
No. 1540.	60.00	55.00	293
No. 1542.	18.00	15.25	306
No. 1544.	39.00	32.75	307
No. 1546.	16.80	15.50	320
No. 1548.	27.00	21.75	303
No. 1550.	21.00	16.25	305
No. 1552.	33.00	27.75	303
No. 1554.	33.00	27.75	317
No. 1556.	8.50	7.75	315
No. 1558.	7.00	6.25	316
No. 1560.	10.00	9.25	314
No. 1562.	16.80	14.25	320
No. 1564.	16.80	14.25	320
No. 1566.	7.20	6.25	319
No. 1568.	93.00	85.00	284
No. 1570.	108.00	100.00	284
No. 1572.	42.00	38.00	291
No. 1574.	54.00	48.00	291
No. 1576.	69.00	63.00	295
No. 1578.	57.0		

from makers for considerable parcels tend to show that they have still orders in hand which prevent their feeling the dullness.

Lead.—Freights from the West to the seaboard have risen so rapidly and materially, that business has been upset by this new feature; from the previous low point of 23c. they have gradually advanced to 50c., and on bullion on the Union Pacific Railroad the rate was also advanced \$2 per ton—quite an item. We now quote Common Domestic Lead, nominally, 6½c. @ 6½c., currency, and Selected, 6½c. @ 6½c., currency. Stock of Common Domestic, last instant, 800 tons; of Foreign, none. The latter we nominally quote 6½c. @ 6½c., gold. Europe was looking up again on a better consumptive demand. Manufactured remains in limited request at 8½c. for Bar, 9c. for Pipe and 9½c. for Sheet, less the usual discount to the trade.

Spelter and Zinc.—The same disturbing influence of enhanced freight rates, to which we alluded in speaking of the Lead market, has also interfered with the regular course of trade in Spelter, for which a corresponding advance is now insisted upon, although not easily obtained, considering the lack of a demand for this metal just at present. We quote the same nominally, 6½c. @ 7c., currency, according to brand. Foreign remains unaltered at the nominal figure of 6½c. @ 7c., gold. Sheet Zinc remains quiet at 8½c. @ 8½c., gold, for "Messerschmitt" and 8½c. @ 8½c., currency, Domestic.

Antimony.—Although little or nothing has transpired, it is held with rather increased firmness at 13½c., gold, in response to the London advice, where it is strong at £37, all round.

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the week ending January 2, 1877:

Danish West Indies		Cuba.	
	Quan. Value.		Quan. Value.
Nails, kegs, 115	\$401	Nails, kegs, 70	\$215
Staple, cs., 4	68	Nails, cs., 13	528
Hamburg.		Steel, case, 1	79
Ag. imp., pkgs, 5	300	Mach., pkgs, 8	1,700
Mach., cs., 25	9,625	Hdw., pkgs., 80	1,734
Copper, cs., 108	27,000	Zinc, cs., 36	431
Hardware, cs., 10	656	Zinc, cs., 2	110
Gun barrels, cs., 3	300	Iron, pkgs., 147	1,735
Antwerp.		Haght.	
Pumps, pkgs., 2	170	Hdw., pkgs., 13	149
Machinery, cs., 17	3,395	Brazil.	
Liverpool.		Ag. imp., pkgs, 60	731
Mf. iron, pkgs., 2	100	Pumps, cs., 4	96
Wringers, cs., 12	320	Iron, cs., 50	315
Tinware, cs., 2	90	New Grenada.	
Car wheels, 130	1,040	Mach., pkgs, 150	5,994
Ag. imp., pkgs, 7	375	Hdw., pkgs., 290	13,445
Mf. g'ds, cs., 2	742	Cutlery, cs., 6	90
Machinery, cs., 6	450	Ag. imp., pkgs, 84	2,516
Hdw., cs., 77	4,177	Cartridges, cs., 3	110
Machinery, cs., 2	745	Nails, kegs., 154	540
Zinc, cs., 4	395	Mf. iron, pkgs, 24	259
London.		Venezuela.	
Hardware, cs., 21	1,250	Ag. imp., pkgs, 3	91
Mach., cs., 3	105	Cartridges, cs., 8	234
British North American Colonies.		Cutlery, cs., 27	1,211
Hdw., pkgs., 8	126	Hardware, cs., 160	2,601
British West Indies.		Machinery, cs., 34	1,711
Iron tubs, 4	161	Tacks, cs., 7	136
Hardware, cs., 7	145	China.	
Nails, kegs., 37	136	Ref. rcs, cs., 2	250
Haere.		Wire cloth, cs., 1	126
Mach., case, 1	450	Machinery, cs., 7	435
Ag. imp., pkgs, 30	3,053	Glasgow.	
Copper, cs., 128	31,250	Hdw., pkgs., 15	620
Cadiz.		Ag. imp., cs., 126	8,690
Pumps, pkgs., 5	325	Ag. imp., cs., 8	620

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending January 2, 1877:

Hardware.		Steel.	
Baker Hermann & Co.	Mdse. pkgs, 15	Prosser Thos. & Sons,	Tire forgings, 24
Anvils, 72		Sulzbacher, Hyman	Wolfe,
Hammacher A. & Co.	Ironware, cs., 27	Wolfe,	Bars, 316
Law & Garlicks,	Mdse. pkgs, 1	Woodford W. O.	Cases, 31
Laughlin & Co.	Wire, bds., 72	Order,	Bundles, 13
Casks, 1		Bars, 4	Rails, 145
Rolls, 4		Casks, 3	Scrap, 108
Moore's J. P. & Sons,	Gun caps, cs., 4	Byrne Jos. & Co.	Tin plates, bxs., 532
Cartridges, bxs, 1		Brown Bros.	Tin slabs, 402
McCoy & Co.	Mdse. pkgs., 2	Gray's John Sons,	Tin, cs., 1
Mdse. pkgs., 5		Hamel J. B.	Scrap, pkgs, 43
Macy R. H. & Co.	Cases, 1	Hart F. W. J.	Tin slabs, 2
Schoverling & Daly,	Mdse. pkgs., 2	Meyer Moritz,	Lead, bars, 654
Wiebusch & Hilger Hdw.	Co.	Nay & Co.	Tin plates, bxs., 1444
Hdw. & Cutlery, cs., 30		Piza D. M.	Copper, kegs, 2
Ward Aeline,	Mdse. pkgs., 3	Roberts, L.	Scrap, brass, cs., 10
Order,		Scheider Jos. & Co.	plates, bxs., 417
Files, cs., 1		Vatiable H. A. & Son,	Wire, fine, cs., 6
Casks, 3		Walford R. G.	Zinc, pig, 19
Chains, cs., 15		Order,	Tin plates, bxs., 9907
Iron.		Lead, bars, 2947	Tin ingots, 300
Hopkins E. T.	Sheets, 400	Naylor & Co.	Tin, slabs, 4669
Hervey A. T.	Pig, tons, 100	Without Bill of Lading,	Antimony, cs., 17
Hazard T. D.	Scrap, tons, 24½	Spelter, slabs, 608	Spelter, pieces, 40
Lang W. Bailey,	Bundles, 90		
Marvel W. D.	Ore, tons, 1090		
Naylor & Co.	Bars, 5486		
Sampson G. G.	Pig, tons, 100		
Order,	Pig, tons, 100		
Ore, kilos, 183,900			

COAL.

Very little trade has been done during the past week in the trade, and at the present date operations are suspended at the mines. Ice and snow have almost laid an embargo upon the movement of coal by land and water. Yesterday New York harbor was so completely filled with ice that it was useless to attempt to move boats, and for some days previous navigation had been greatly impeded. The stagnation in trade is not at all unexpected at this season of the year. The severe weather, coupled with the fact that stocks at the East are rapidly growing lighter, leads to a general opinion among dealers in the city that the market will grow somewhat stiffer later in the season. This opinion is strengthened by the fact that it is practically impossible to send Coal Eastward at the present time. Only large cargoes can be got, and extravagant prices are asked. To

Portland, Me., \$2.25 has been paid; to Providence, \$1.50 is asked, but nothing going, and it is reported that everything is frozen up all the way in from Newport. The rate to New Haven is 70 to 75 cents, a rise of from 10 to 15 cents within a week.

The freight to Boston is reported at \$2.10 in vessels, but we think that more has been asked and obtained. Just at present vessels cannot be obtained, as they could not be moved about the harbor, and it is not probable that vessels can be obtained for some little time if this weather holds. The Boston Commercial Bulletin of Saturday says:

"Since the sales of last week there has been a little better feeling among the trade. The demand at retail continues good, and it is now believed that householders did not this year in a whole winter's stock to so great an extent as usual, the sudden collapse of the combination leading many to suppose that they could get their Coal at continually lessening prices. Since the great decline in Anthracite the movement among manufacturers for the discontinuance of its use and the substitution of Bituminous has come to a close, and the tide is now rather setting the other way."

We enlarge our table of quotations this week, but note no changes in prices. Our quotations will be found on the 24th page.

OLD METALS, PAPER STOCK, &c.

There are no signs of improvement in the condition of this market since our last report. In Old Metals the supply is greater than the demand, and dealers are unable to dispose of any considerable quantity, no matter how great the concessions may be. In the Rag and Paper Stock markets there is very little doing, but prices, however, remain nominally unchanged. We quote the following as the current purchasing rates:

Old Metals.—Copper, 10c. per lb.; Yellow Metal, 10c.; Brass, 9c.; Composition, heavy, 13c. @ 13c.; Lead, solid, 4½c.; Tin Lead, 4c.; Zinc, 4c.; Pewter, No. 1, 13c.; do., No. 2, 8c.; Spelter, 5½c.; Wrought Iron, \$21 per ton; Light do., \$10 per ton; Store Plate, \$9 per ton; Machinery, do., \$12 per ton; Burnt Iron, \$4 per ton.

Rags, &c.—Canvas, Linen, 4½c. @ 5½c.; do. Cotton, No. 1, 5½c.; No. 2, 2½c.; White, No. 1, 5c.; No. 2, 4c.; Colored, do., 2c.; Mixed, Woollen, 2c. @ 3c.; Soft, do., 5½c.; Gunny Bagging, 1½c.; Jute Butts, 1½c. @ 2c.; Kentucky Bagging, 3c.; Book Stock, 3½c.; Newspaper Stock, 2½c.; Waste Paper and Scraps, 1½c.; Kentucky Bale Rope, 4c.; Oakum Junk, No. 1, 4½c. @ 5c.; do. No. 2, 3c.; Tarred Shaking, 1c. @ 1½c.; Grass Rope, 3c.

PHILADELPHIA.

Office of The Iron Age, 230 South Fourth St., PHILADELPHIA, Jan. 2, 1877.

The general condition of the manufacturing interests, as connected with iron, is still one of depression, and 1876 may be classed as one of the most unsatisfactory ever experienced. There has been no activity in any branch; some have had short "spurts," but nothing permanent, and nothing profitable. This, however, is one of the usual concomitants of dull times; if business is limited, prices are cut fine to secure a share of what is going, and then there is the further disadvantage of doing a small business under a higher ratio of expenses. Some of our largest and best equipped establishments, with every facility for doing business, have suffered the same as others, and in many departments there are still no signs of improvement. One of the branches which has suffered most is that in machinery and machinists' tools, and although the productions of our workshops have been a wonder and surprise to Americans, as well as to visitors from other lands, we can as yet report no general increase in business. Most of our leading firms made some sales of machinery to foreign countries—in fact, to almost every country in Europe—and a few orders have been received since the close of the Exhibition, but it remains to be seen whether it will eventually develop into anything permanent.

Iron shipbuilding shows signs of life, and we hope in a few days to give a report of new contracts; in the meantime, in addition to the three large vessels just commenced, there is a probability of at least one or two others of large size being contracted for.

The Baldwin Locomotive Works have had a fair business, compared with 1875. They have turned out nearly double the number of locomotives, but the money value has not been so large in proportion. The same complaint is made in this branch, as in others, prices are too low to leave any margin of profit. About 1000 men are employed in this establishment, but there are no important orders on hand. Their regular force is about 3000 hands. In other branches connected with the railway interest some of the leading establishments continue as for months past, virtually closed.

The trade in agricultural implements has been satisfactory in bulk, but the reverse in regard to prices. Competition has been unusually close, and with the desire to form new connections during the Centennial prices were cut to the lowest possible figure. A fair beginning has been made, however, toward building up an export trade, and there is a hopeful feeling in regard to the future.

The tool trade may be classed with others, so far as regards its general condition. The bulk of business is quite equal to the previous year, but prices have been cut to the lowest point, and manufacturers complained that "there is no money made." Some progress has been made towards building up an export trade to Europe, particularly in saws, and there is a reasonable prospect of its permanency. The Messrs. Disston continue their full complement of workmen (1000), although at present on short time, but expect to increase it immediately. They report a larger amount of orders on hand than at this time a year ago, and think prospects would be quite encouraging if the political status of the country was clearly defined.

The edge tool trade, the file trade, the

lock manufacturers, and other branches connected with the hardware business, make similar reports, and to give details would be a mere repetition of the above.

The hardware jobbing trade has been somewhat disappointing, both in regard to amount of goods sold and profits realized. The demand has been uncertain and irregular, while in some departments, such as in mechanics' tools, business has been exceedingly depressed. Prices, too, have been declining, and as a rule 1876 has been less satisfactory than 1875. The amount of goods sold, however, may be considered somewhat greater than last year, though less in money value, and profits have been curtailed by the shrinkage in values. The Exhibition does not appear to have been of any advantage to jobbers, and although a few new accounts have been opened, it is thought that in many instances the money spent in sight-seeing ought to have gone to pay of indebtedness. There is, however, a feeling of confidence that an early improvement will take place, and that 1877 will fully counterbalance the deficiencies of 1876. This feeling is based upon the fact that prices now seem to be steadier, with an upward tendency, and with bare shelves all through the country purchases cannot be postponed to any extent. In fact, it is believed that all that is necessary to restore confidence and place things on a healthy basis is a settlement of the presidential question. Many experienced hardware men, both manufacturers and jobbers, think that if the settlement is delayed until March it will seriously affect the spring trade, but if matters are arranged within the next two or three weeks a good business is certain.

The stove trade has probably been the poorest for years, in regard to amount sold and prices realized. The demand has been disappointing in the extreme, and chiefly for low-priced goods. In no department can the hard times be more plainly seen than in the stove trade. Ornament and style has given place to utility, and first cost has been the primary consideration with most buyers. Not only against the hard times have our manufacturers had to contend, but competition from other points has been unusually close. The growth of manufacturing industries in the West cuts off a large proportion of trade in that direction, and it is becoming apparent that our establishments will in future have to depend to a great extent upon the seaboard trade. This is also the case with other heavy iron goods, as well as in stoves; the tendency of trade to become localized is very marked. With the raw material and labor at hand the saving in freight and risks of transportation form a profit in themselves, which have not failed to attract attention and result in the establishment of manufactories at various points throughout the country. This feature of the trade will probably become more marked hereafter, and though somewhat unfavorable to Eastern manufacturers, it must be kept in mind that the advantage is on their side in the case of a foreign trade being built up. One of the sources of England's strength in the export trade is in the fact that all her leading manufacturing towns are within easy reach of the seaboard, from which at low freights she has access to the whole world.

The trade in plumbers' supplies has been one of great depression; probably no department has suffered more severely than this. One result of this condition of affairs is an extreme indifference about extending business. Manufacturers and jobbers say, "If we can't make anything we may as well keep our goods." This feeling prevails in other branches as well as in this, consequently buyers are kept pretty well up to the cash system, and if business is not very profitable it is at all events safe.

The weather is unusually severe, and to-day we have a regular snow blockade. The distress among the working classes is very great, but notwithstanding the hard times among business men they respond nobly to the wants of the destitute. Messrs. Henry Disston & Sons alone supply food daily to 1000 to 1500 of the poor in the neighborhood of their works, and a vast amount of suffering is thus alleviated.

Pig Iron.—At this writing the market has scarcely opened, and the feeling is so uncertain that it is impossible to predict what figures are going to rule. There is no prospect of higher prices, and although we fall to see any good reason for lower rates, the indications are rather in that direction than otherwise. The anxiety among producers to effect sales prevails to such an extent that a few days of dullness makes them think of lowering prices, while the only effect it has upon buyers is to make them more conservative than ever, and so far as we can learn does not result in larger business. The present condition of the market appears to be that sellers are inordinately anxious to find customers, not because they are carrying much stock, but rather to keep sold close up, and also to secure business to themselves and keep out competition. While this is probably true in the majority of cases, others claim to favor lower prices on philanthropic grounds. They assert that with iron at a shade lower prices the demand will be stimulated, and that business to many of our manufacturing concerns can be secured, and numbers of operatives now out of employment put to work. This would be a very desirable thing, but so far, that line of policy does not seem to have been much of a success, as with lower prices there is less business than ever. There is also a disposition to learn something definite in regard to the actual stock of iron before launching out into a large business.

The strongest feature in the market is that no large lots are offering, and if buyers came in the market for anything beyond their regular requirements prices would undoubtedly stiffen. It becomes, therefore, simply a question of demand, and the demand will depend upon the general condition of business. Should there be any increase of orders to our iron working establishments, the effect must be immediately felt at the furnaces, as no stocks of importance are in consumers' hands. In this connection we may mention the fact that some of our railway companies are already negotiating for large additions to their rolling stock, and it is quite likely that we shall be able to report, in course of a week or two, the closing of some important contracts, which may favorably affect the iron market. We continue quotations as before, viz., No. 1 Foundry, \$21 to \$21.50; No. 2, ditto, \$19 to \$20; and Gray Forge, \$18.50 to \$19.50.

Blooms.—We have no business of importance to note, but the feeling is steady and prices firm. A good many inquiries are being made, and it is likely that there will be a more active trade shortly. We quote as follows: Charcoal Scrap Blooms, \$45 to \$47; Charcoal Ore Blooms, \$40 to \$42; Charcoal Billets of superior quality, \$55 to \$62; and Bars for converting into steel, made of best Champlain Iron, \$72 to \$75. Strictly Cold-blast Charcoal Blooms, hammered, are quoted \$60 to \$62, and Billets, \$70 to \$72.

Ores.—Business at the moment is rather inactive, but from the number of inquiries which are being made an active movement is anticipated. Some few sales are reported at the following figures: New Jersey Magnetite—Hacklebarney Bessemer Select (Broken), \$3, cash, f. o. b.; Red (washed), for Foundry Metal, \$3.75 to \$4, f. o. b. Port Orm; Magnetic Lancaster Ore, suitable for Anthracite or Bessemer purposes, \$3 per ton, f. o. b. Baumgardner's Station, Pa. Virginia, and Lake Champlain Ores, are entirely nominal, and no recent business is reported.

Manufactured Iron.—The mills have mostly been closed the past ten days, and very little business has been done. There is a somewhat better feeling, however, and if numerous inquiries can be taken as indication of improvement, we shall have one very soon. Quite a number of orders have been received already, not very extensive it is true, but sufficient to give tone to the trade. It confirms the impression that stocks are run down very low, and gives assurance that the demand cannot be less than it has been, and indicates a fair prospect of some increase. The advance in railway freights seems to have a good effect in this locality, as it keeps out Western Iron, and there is also a promise of a demand for Railway purposes as well. It would be premature to venture any prediction in regard to the future, but the prospect seems cheerful.

Prices are nominally unchanged, viz.: Bar Iron, 2½c. to 2½c. for Ordinary Brands, and 2½c. to 2½c. for Best Refined; Tank Iron, 2½c. to 3c. and upward, according to quantity and quality; Skelp, 2½c. to 2½c.; Muck Bar, \$37 to \$39.

Horseshoe Iron.—The demand is moderate, and prices without change, say, \$67.50 to \$69 for 1½ and 2½c.

Steel Rails.—Since our last report we cannot learn of any important sales. In fact, this business like others has been in a state of abeyance for the past 10 or 14 days. The mills are all fairly employed, however, most of them having sufficient orders on hand to keep them busy for the next 60 or 90 days. They are as eager as ever to secure orders for prompt delivery, and we understand negotiations are pending for some 40,000 to 50,000 tons. Prices have got down very low, almost if not quite to cost of production, but buyers show no anxiety, although prices seem very tempting. We quote as before, \$50 at mills as the nominal rate, with sales of a few small lots for prompt delivery at a slight concession from that rate.

Iron Rails.—We cannot report any new business, and things may be said to be decidedly flat in this department. There is a better feeling, however, at the Rail Mills, and it is expected if there is any improvement in business a share of it will be in that direction. In the meantime no important change is anticipated until the election matter is settled. Prices remain as last quoted, say, on a cash basis, at mills, ordinary Rails, \$34.50 to \$36, and standard brands, \$37 to \$38.50.

Spikes.—There is very little doing, and prices are without change. We quote: Railway Spikes, 2½c. to 2½c., and Mining Spikes, 4 to 4½ by ½, 2½c.; 4 to 4½ by 7-16, 3c.; 3½ to 4 by ½, 3½c.

Old Rails.—We have no sales to report; some extra lots are held at \$22, but it would be difficult to find a market at anything over \$20, and we doubt if any could be placed at that figure. We quote as a fair average \$20.50 to \$21.50, according to quality.

Scrap Iron.—The market continues easy; the quantity offering being small, prevents any serious decline. Buyers are particular in selection, and at the outside price quality must be very superior. We quote as before for good average qualities: Wrought, \$24 to \$25; Cast, \$15 to \$17.

Nails.—Prices remain as before, \$2.50 to the trade and \$3.15 to consumers.

Tin Plates.—There has been a moderate amount of business passing, and the feeling in prices is very firm. As the spring approaches a large demand is anticipated, and also some advance in prices. We quote in U. S. currency as follows: 1 C, 10x14, \$8 to \$8.25; 1 X, 10x14, \$10.25 to \$10.50; Best Charcoal Lead, 25x20, \$15.50 to \$17; other good brands, \$14.25 to \$14.75; good fair, \$13.50 to \$14.50; Bright Tin for Cans, &c., \$6.50 to \$7.25; good Bright Tin, do. \$7 to \$7.75; Coke, Leaded, 14x20, \$6.50 to \$6.75.

Lead.—The market is dull and inanimate, and sales are of the merest retail character and to supply pressing requirements. We quote Domestic at 6½c. to 6½c., currency. Foreign dull and nominal at 6½c., gold. Manufactured is steady. We quote: Bar

8½c.; Pipe, 9c.; and Sheet, 9½c., less 10 per cent. to the trade.

Shot.—Remains quiet at the following quotations: Drop Shot, 25 lb. bags, 9½c.; do., 5 lb. bags, 10½c.; Buckshot, 25 lb. bags, 10½c.; do., 5 lb. bags, 11½c.; Conical Balls, 25 lb. bags, 10c. per lb., net; Bar Lead, 5 oz., ¾ lb. and 1 lb. bars, 8½c., less 10 per cent. to the trade.

Old Metals.—The demand is very light, and offerings in excess of requirements. We quote: Heavy Old Copper, 16c. to 16½c.; Light Tinned Copper, 14c.; Copper Bottoms, 13½c.; Heavy Red Brass, 13c.; Light Red Brass, 12½c.; Heavy Yellow Brass, 11c.; Light Yellow Brass, 10c.; Heavy Clean Pig Lead, 5½c.; Junk Lead, 5c.; Tea Lead, Light Paper, 5½c.; Tea Lead, Heavy Paper, 5c.; New Zinc Clippings, 4½c. to 4½c.; Old Sheet Zinc, 4c.; Yellow Brass Turnings, 8c. to 9c.; Red Brass Turnings, 10c. to 11c.; Plumbers' Lead Joints, 6c.

CHATTANOOGA.

Mr. S. B. Lowe, under date of Jan. 1, reports as follows: With the exception of some inquiries for Cold-short metal from the West, and also for Muck Bar, there can be nothing new reported. There is no disappointment manifested at the continued dullness, but there is no disposition to concede in prices.

COKE.

No. 1 Foundry, extra, 22.00 @ 22.00	
No. 1 Foundry, 21.00 @ 21.00	
No. 2 Foundry, 19.00 @ 19.00	
Gray Forge, 17.50 @ 17.50	
White and Mottled, 16.00 @ 16.00	
White and Mottled, 15.50 @ 15.50	

HOT BLAST CHARCOAL.

No. 1 Foundry, extra, 22.00 @ 22.00	
No. 1 Foundry, 21.00 @ 21.00	
No. 2 Foundry, 19.00 @ 19.00	
Gray Forge, 17.50 @ 17.50	
White and Mottled, 16.00 @ 16.00	
White and Mottled, 15.25 @ 15.25	

COLD BLAST CHARCOAL.

Car Wheel Metal, 22.00 @ 22.00	
Forge Metal, 17.00 @ 17.00	
Muck Bar, 30.00 @ 30.00	
Cast Scrap, Heavy, per ton, 12.00 @ 12.00	
Cast Scrap, Light, 8.00 @ 10.00	
Old Car Wheels, 18.00 @ 19.00	
Old Rails, 18.00 @ 18.50	
No. 1 Wrought Scrap, per lb., ½c.	
No. 2 Wrought Scrap, ½c.	
Brown Hematite Ore, 50 to 56 per cent. per ton, \$2.00 @ 2.50	
Reddish Hematite Ore, 50 to 56 per cent. per ton, 1.80 @ 1.95	

BALTIMORE.

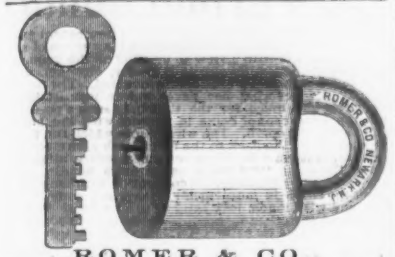
Messrs. WERTH & BROTHER, Iron and Steel merchants, 46 and 48 South Charles street, report us the following prices under date of Jan. 2: There has been little of interest to note in this market for the past week. Trade has been excessively quiet at unaltered quotations.

AMERICAN REFINED BAR IRON.

1 to 6 wide by $\frac{1}{2}$ to 1 thick, . . .	2.15 to 2.25c.	Per lb.
1 to 4½ wide by $\frac{1}{2}$ to 2 thick, . . .	2.15 to 2.25c.	Per lb.
Round and square, ordinary sizes, from $\frac{1}{2}$ to 2 inclusive, . . .	2.15 to 2.25c.	Per lb.
Hoop iron, $\frac{1}{2}$ wide and upward, . . .	3½ to 3½c.	Per lb.
Band iron, from $\frac{1}{2}$ to 4 in. wide, . . .	3 to 3½c.	Per lb.
Horse Shoe iron $\frac{1}{2}$ to 1 wide by $\frac{1}{2}$ to thick, . . .	3½ to 4c.	Per lb.
Norway Nail Rods, . . .	6 to 6½c.	Per lb.
Black Diamond Cast Steel, Plates, Squares and Octagon, ordinary sizes, . . .	14½ to 15c.	Per lb.
Cast Spring Steel, . . .	8 to 9c.	Per lb.
Homogeneous Steel Plate, . . .	8½ to 9c.	Per lb.
Perkins' Horse Shoes, per keg of 100 lbs., . . .	\$4.62½	Per keg.
" "		

WILSON BOHANNAN

Manufacturer of Patent
BRASS
Pad Locks,
FOR
Railroad Switches,
Freight Cars,
AND THE HARDWARE TRADE.
All sizes, with Brass and Steel
Keys, with and without chains.
PASSENGER CAR LOCKS,
Bronzed, Nickel-Plated and Japanned.
BROOKLYN, N. Y.
Catalogues and Samples sent upon application.



ROMER & CO.,
Established 1837. Manufacturers of Patent Scandinavian
or Jail Locks, Brass Pad Locks for Railroads and
Switches. Also, Patent Stationary H. R. Car Door
Locks, Patent Piano and Sewing Machine Locks.
141 to 145 Railroad Avenue, NEWARK, N. J.
Illustrated Catalogue sent upon application.

LEIGHTON BRIDGE AND IRON WORKS,**Rochester, N. Y.****Wrought Iron Riveted
Lattice Railroad**

AND

HIGHWAY BRIDGES.**Wrought Iron
WATER PIPE.**The most economical and durable Pipe manu-
factured for Water Works, Oil Lines or Gas Mains.**General Riveted Work**Orders Solicited from Civil Engineers
and Contractors.[Accompanying engraving represents the Spring-
field Bridge, built by the Leighton
Bridge and Iron Works.]**L. COES'**
Genuine Improved Patent
SCREW WRENCHES.Manufactured by
L. COES & CO.,
Worcester, Mass.

We invite the particular attention of the
trade to our New Straight Bar Wrench, widened,
full size of the larger part of the so called
"reinforced or jog bar." Also our enlarged jaw,
made with ribs on the inside, having a full
bearing on the front of bar (see sectional view),
making the jaw fully equal to any strain the
bar may be subjected to.

These recent improvements in combination
with the nut inside the ferrule firmly screwed
up flush, against square, solid bearings (that
cannot be forced out of place by use), verifies
our claim that we are manufacturing the
strongest Wrench in the market.

We would also call attention to the fact,
that in 1869 we made several important im-
provements (secured by patents), on the old
wrench previously manufactured by L. & A.
G. Coes which were at once closely imitated
and sold as the Genuine Wrench by certain par-
ties who seem to rely upon our improvements
to keep up their reputation as manufacturers,
and although the fact of their imitating our
goods may be good evidence that we manufacture
a superior Wrench, we wish the trade may
not be deceived on the question of originality.
Trusting the trade will fully appreciate our
recent efforts, both in improvements on the
Wrench and in the adoption of a Trade Mark,
we would caution them against imitations.
None genuine unless stamped

"L. COES & CO."Warehouse, 97 Chambers St., & 81 Reade Sts., N. Y.
HORACE DURRIE & CO., Sole Agents.

M.H. JONES & CO.
BEST OF STEEL AXES
AND EDGE TOOLS.
Horace Durrie & Co. Agents, New York.

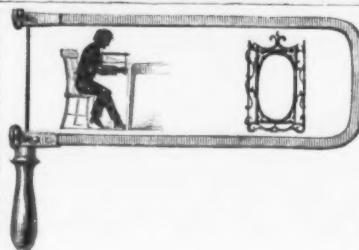
HAMMER & CO.,**Brantford, Conn.,**

Manufacturers of the following Patented Articles of

MALLEABLE IRON:

Hammer's Adjustable Clamps.
Hammer's Malleable Iron Oilers.
Hammer's Mail Iron Hand Lamps.
Hammer's M. I. Hanging Lamps.

For Sale by all the principal Hardware Dealers.

Malleable Iron CastingsOf superior Quality and Hardware Specialties in
Malleable Iron made to order.

We wish to inform Hardware Dealers through-
out the country that we are putting up for the
Christmas trade, in neat paper boxes, the following
articles:

**One Highly Polished Spring Steel
Bracket Saw Frame,** with patent indestructible
Clamps.

Six Saw Blades.

Fifty Designs, embracing a great variety of
fancy and useful articles.

One Sheet of Impression paper, and**One Brad Awl.**

With full directions for using the Saw.

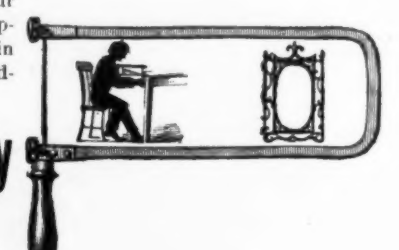
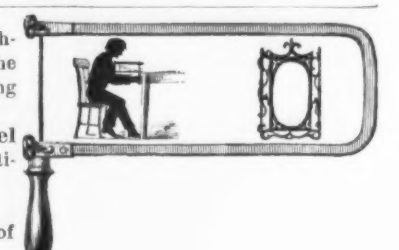
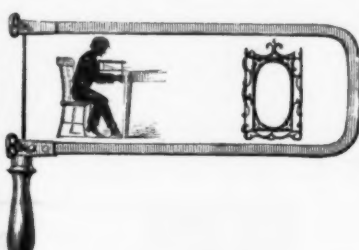
List price, per Box, \$1.25.

We have advertised these goods thoroughly
throughout the country, and notified all interested
persons that they could buy of the dealers at our
regular rates. The demand for these tools is rap-
idly increasing, and some of them are in use in
almost every town. They will sell in every hard-
ware store where shown.

Millers Falls Company

74 Chambers Street, NEW YORK,

Corner of Broadway.

**Silver's Patent Meat Stuffers.****Nos. 1 and 2. Single Ceared.**

Capacity of No. 1, 6 lbs. Weight of No. 1, boxed, 30 lbs. Price, \$6.00.
Capacity of No. 2, 9 lbs. Weight of No. 2, boxed, 40 lbs. Price, 9.00.

**Nos. 3 and 4. Double Ceared.**

Capacity of No. 3, 12 lbs. Weight of No. 3, boxed, 60 lbs. Price, \$18.00.
Capacity of No. 4, 20 lbs. Weight of No. 4, boxed, 75 lbs. Price, \$25.00.

FAMILY SIZES.

THE BEST IN USE. SEND FOR CIRCULAR.

BUTCHERS' SIZES.**BAILEY WRINGING MACHINE CO., 99 Chambers St., N. Y.****THE EAGLE ANVIL****!! WARRANTED !!**

(ESTABLISHED) 1843.

These Anvils are superior to the best English, or other Anvils, on account of
the peculiar process of their manufacture (invented and used only by this concern),
and from the quality of the materials employed.

The best English Anvils become hollowing on the face by continued hammering
in use, on account of the fibrous nature of the wrought iron—causing it to "settle"
under the face.

The body of the Eagle Anvil is of crystallized iron, and no settling can ever
occur; the steel face, therefore, remains perfectly true. Also, it has the great ad-
vantage that being of a more solid material, and consequently with less rebound,
the piece forged receives the full effect of the hammer, instead of a part of it being
wasted by the rebound, as of a wrought iron anvil. An equal amount of work can,
therefore, be done on this Anvil with a hammer one-fifth lighter than that required
when using a wrought iron anvil.

The working surface is in one piece of JESPER'S BEST TOOL CAST STEEL, which,
being accurately ground, is hardened and given the proper temper for the heav-
iest work. The Anvil is covered with and its extremely made entirely of steel.
The body of the Anvil is of the strongest grade of American iron, to which the cast
steel face is warranted to be thoroughly welded and not to come off.

Price List, October 1st, 1876. ANVILS weighing 100 lbs. to 800 lbs., 90c. per lb.
Smaller Anvils, ("Minims.")

No. 0 1 2 3 4 5 6 7 8 9
Weighting about 5 lb. 10 lb. 15 lb. 20 lb. 30 lb. 40 lb. 50 lb. 60 lb. 70 lb. 80 lb.
\$2.25 \$2.75 \$3.25 \$4.00 \$4.50 \$5.25 \$6.00 \$6.75 \$7.25 \$8.00

N.B.—These are the RETAIL PRICES. The only additional cost will be the freight to
the purchaser's place of residence.

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Louisville.—Messrs. W. B. BELKNAP & CO. **FISHER & NORRIS, Sole Manufacturers, Trenton, N. J.**

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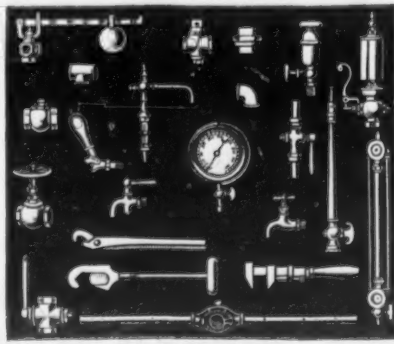
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Send for price list. **Buffalo, N. Y.**
RUSSELL & ERWIN MFG. CO. NEW YORK & PHILADELPHIA AGENTS.

EATON, COLE & BURNHAM CO.,

58 John Street, New York.

Wrought Iron
PIPE,
Cast Iron
LARGED PIPE,
Cast Iron
RADIATORS
and BOILERS.



Brass & Iron
STEAM
Gas & Water
FITTINGS.
PLUMBERS'
MATERIALS.

STEAM GAUGES, TOOLS,
And all Supplies used by Machinists, &c.

Pyrolusite Manganese Co.,

MINERS, DEALERS AND EXPORTERS OF HIGHEST
Crystallized Black and Gray Oxides of
MANGANESE.

Ground, granulated and especially prepared to suit all branches of the home trade.
Warranted to contain from 70 to 90 per cent. peroxide of manganese, and to give satisfaction with regard to price and quality.

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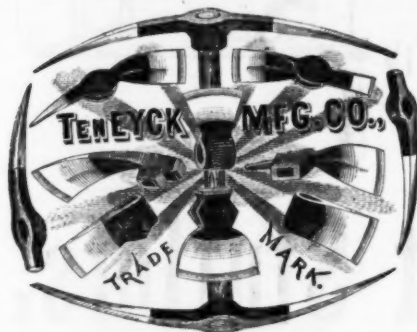
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DEALER IN

HOT & COLD BLAST, CHARCOAL & COKE
Pig Iron.

Chattanooga, Stonewall and Cumberland Gap Furnaces.

AGENT FOR THE SALE OF

**LIGHT T RAIL, RAILROAD SPIKES, FISH PLATES
AND BOLTS AND RAILROAD SUPPLIES.**



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Manufacturers of

AXES

Of all kinds.

Hatchets, Adzes, Grub Hoes, Mat-
tocks and Picks.

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plication.

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TRADE MARK.
MANUFACTURERS OF
PURE WHITE LEAD, RED LEAD,
Litharge, Orange Mineral,
Linseed Oil
AND PAINTERS' COLORS.



The Atlantic White Lead and Lin-
seed Oil Company,

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White Lead (Atlantic), Red Lead,
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WETHERILL & BROTHER,
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RED LEAD, LITHARGE & ORANGE MINERAL.
OFFICES, 31st STREET, Below CHESTNUT, PHILADELPHIA.

Brooklyn White Lead Co.



White Lead, Red Lead and
Litharge.
57 Maiden Lane, NEW YORK,
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JOHN JEWETT & SONS,

Manufacturers of the well known Brand of

WHITE LEAD.



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182 Front Street NEW YORK

Pipe, Fittings, &c.

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MANUFACTURERS OF

BRASS COCKS AND VALVES

For STEAM, WATER and GAS.

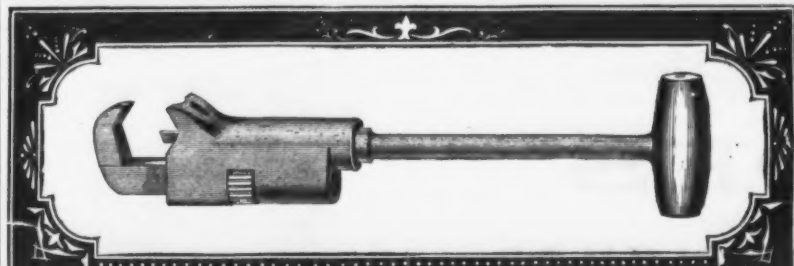
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The Acme Pipe Cutter.

MADE ENTIRELY OF SOLID CAST STEEL.

Cuts Wrought Iron, Brass and Copper Pipes,
Round Iron &c perfectly true without leaving
burr on pipe, contracting or splitting it. Cuts
out a chip similar to a lathe tool. The knife
may be removed and ground. Send for descriptive
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PHILADELPHIA PA



Edward H. Knight's Pat. Ratchet Screw Wrenches



Patented May 30, 1876.

Best and Strongest in the Market.
"STEEL BAR." SAVES HALF THE TIME.

First Premium awarded at the Centennial Exhibition.

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Butchers' Cleavers,
Butchers' Choppers,
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Grub Hoes and Mattocks,
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Ring Bush Hooks,
Axe Eye Bush Hooks,
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Carpenters' Drawing Knives,
Coopers' and Turpentine Tools.

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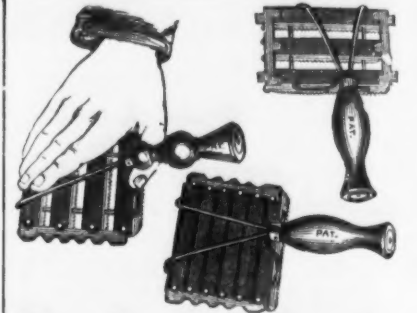
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WESTMINSTER, MD.



Portable Engines, vertical and horizontal, off and on
wheels, horizontal, vertical and yacht Engines, Boilers,
Saw Mills and Mill Machinery, at better prices and on bet-
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Also steam and power Pumps, Belting, Packing, Hose
and general supplies.
Embossed Rubber Matting, 24, 30 and 36 in.
wide, suitable for Banks, Stores, Coffee Houses,
Depots, Cars and all places where there is much
travel. Send for sample and prices.



The Perfect Comb.

We call your attention specially to our new patent end-
less wire frame comb. The result of a long series of ex-
periments, made with a view to meeting all the require-
ments of a Perfect Comb. It is better, stronger, and
more durable than any ever before invented. The raised
wire shank gives what has never before been attained,
viz: a rest and brace for the thumb, in such a position
that the hand cannot come in contact with the horse
while using the comb. The wire braces which run from
the shank over the back to the front teeth give strength
and durability in a direction never heretofore attained,
and at the same time serve as an extra handle; and
when clasped by the fingers in connection with the raised
shank the comb is more firmly, easily, and completely
held, and with much less fatigue to the hand than is
possible in any other formation—in short, it needs but a
trial to vindicate its name: **The Perfect Comb.**

THE LAWRENCE COMB CO.

Factory and Office,

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WM. S. CARR & CO.



Sole Manu-
facturers of

CARR'S

PATENT

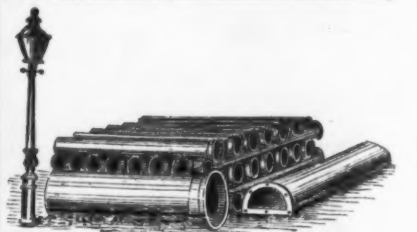
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Closets,

PUMPS, CABINET WOOD WORK, &c.

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FOR WATER AND GAS.

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Mathew's Pat. Anti-Freezing Hydrants.

400 CHESTNUT STREET.



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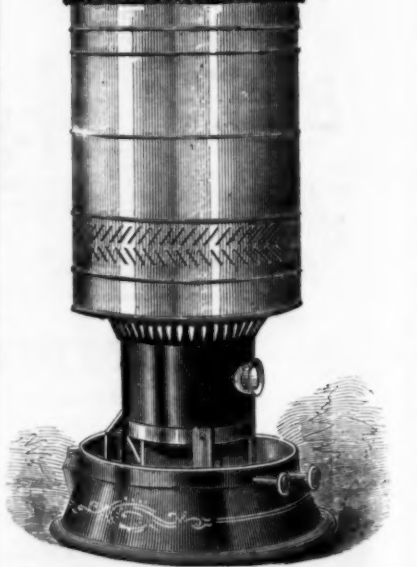
"SUMMER QUEEN"

Oil Cook Stove.

FOUR SIZES.

Suitable for all purposes, for Cooking, Bak-
ing and Ironing.

NON-EXPLOSIVE.



We would respectfully call the attention of the
Trade and Public to our Heating Drum, which, in
connection with our Summer Queen Oil Stove or
Centennial Gas Stove, is well adapted to heat small
chambers, green houses, etc.

No Smoke. No Ashes.

C. RIESSNER & CO.,

242 Pearl Street, N. Y.

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Asphalt, Manufacturers of.

Bit Braces, Manufacturers of.

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Harvey H. H., Augusta, Me. 35

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Blowers.

Keystone Portable Forge Co., Philadelphia. 31

Asphalt, Manufacturers of.

Bolt Brackets, Makers of.

Forreugh Wm. F., Jr. & Bros., Phila. 35

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Bolts (Screws).

Samuel Hall & Son Co., 239 W. 10th, N. Y. 13

Asphalt, Manufacturers of.

Brazing, Manufacturers of.

Phizer Uas. & Co., New York. 6

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Brass Castings, Manufacturers of.

Phizer Uas. & Co., New York. 6

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Brass Castings, Manufacturers of.

Phizer Uas. & Co., New York. 6

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Brass Castings, Manufacturers of.

Phizer Uas. & Co., New York. 6

Brackets, Brass, Makers of.

McNab & Harlin Mfg. Co., 56 John, N. Y. 26

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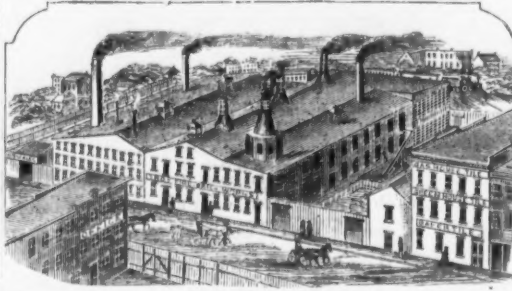
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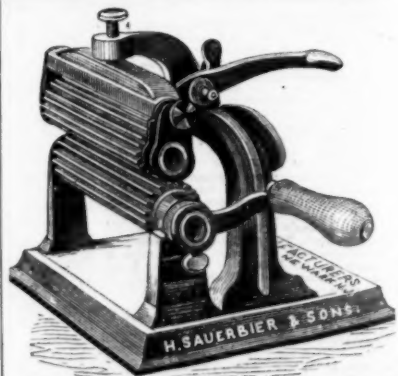
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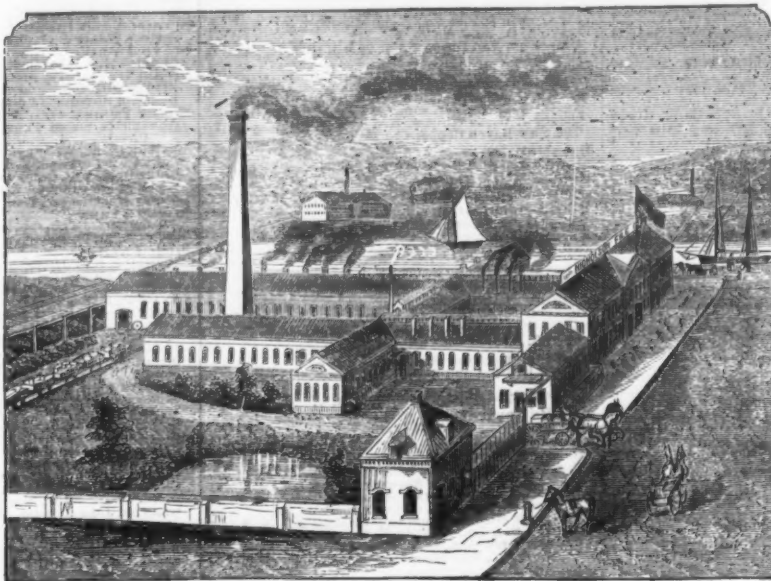
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- Sixth.—The "Increment cut" File, by our records, will remove more stock with a given number of pounds applied than any other File with which we are acquainted.
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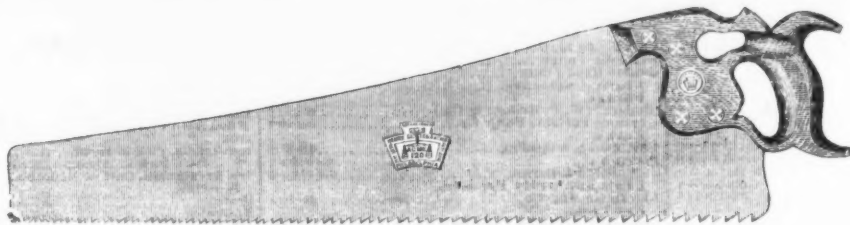
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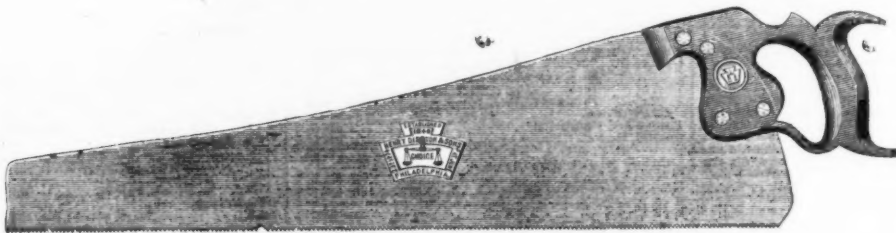
Brick Trowels,
Philadelphia Pattern.



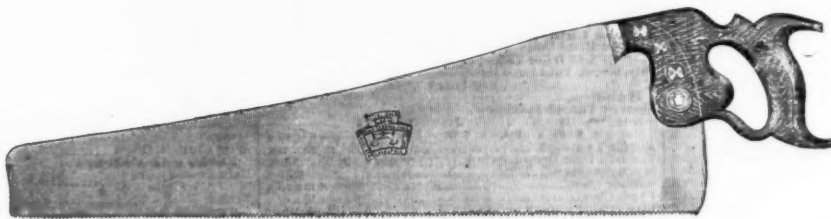
Revolving Shield Screw Driver.



Patent Double Grip Skew Back Saw.



Patent Skew Back "Choice," No. 80.



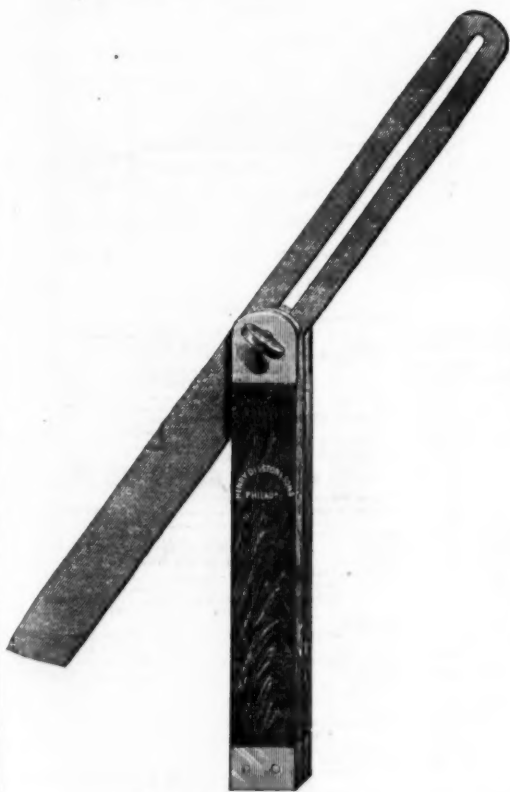
Patent Skew Back, No. 76.



Gauges.



Brick Trowels,
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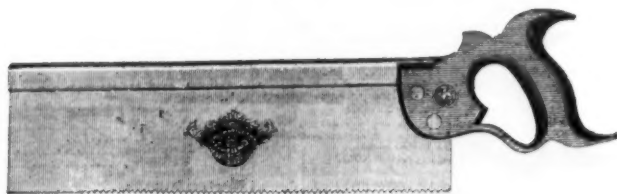
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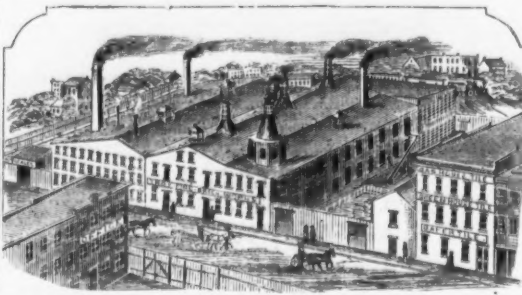
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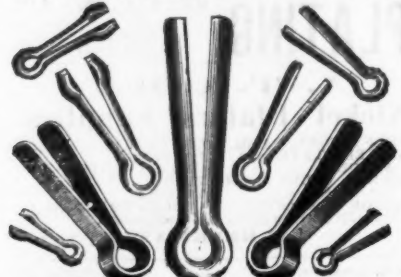
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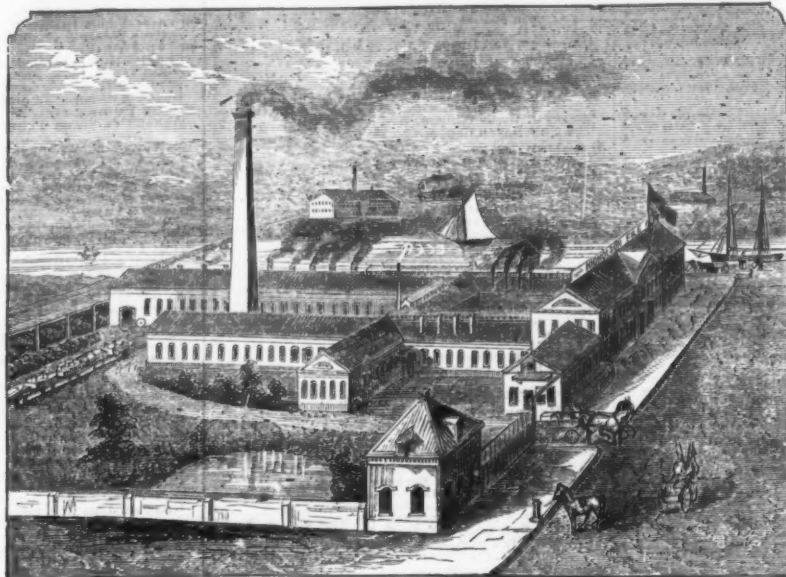
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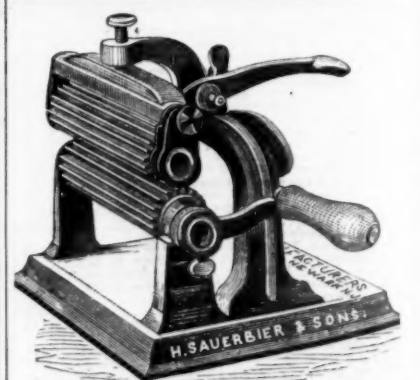
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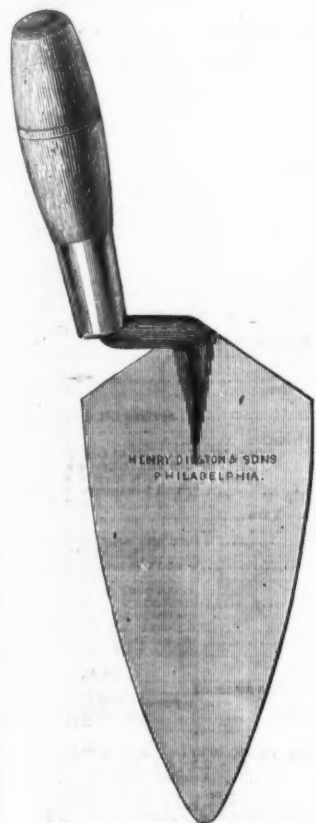
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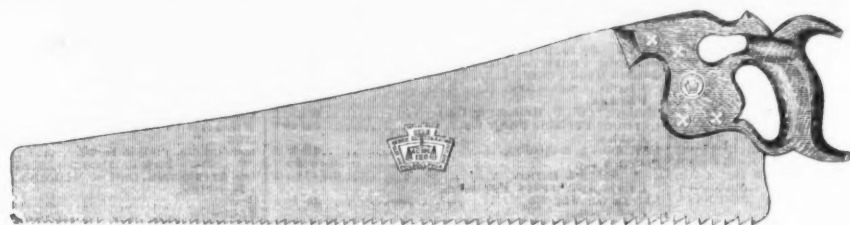
Our Celebrated Skew Back Hand Saws.



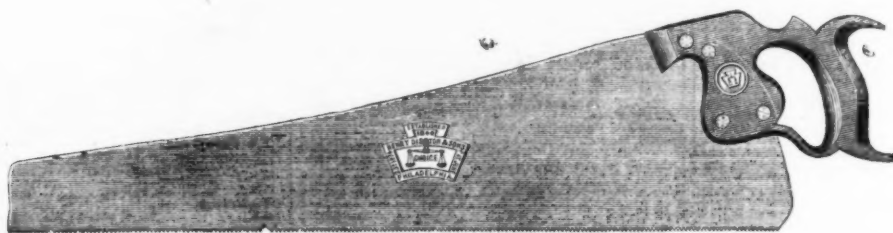
Brick Trowels,
Philadelphia Pattern.



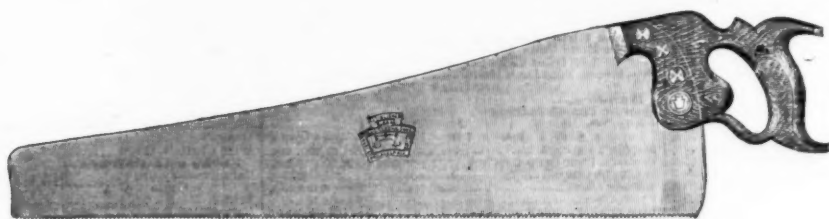
Revolving Shield Screw Driver.



Patent Double Grip Skew Back Saw.



Patent Skew Back "Choice," No. 80.



Patent Skew Back, No. 76.



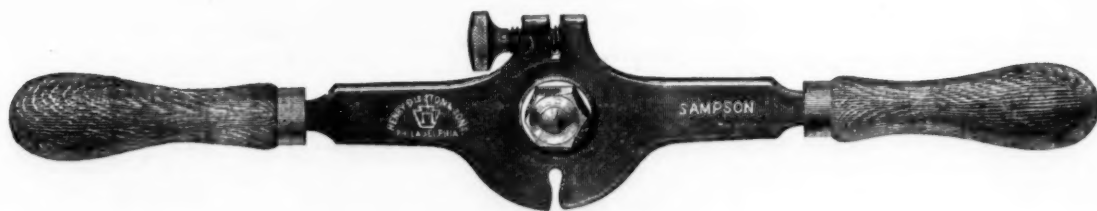
Gauges.



Brick Trowels,
London Pattern.



Bevels.

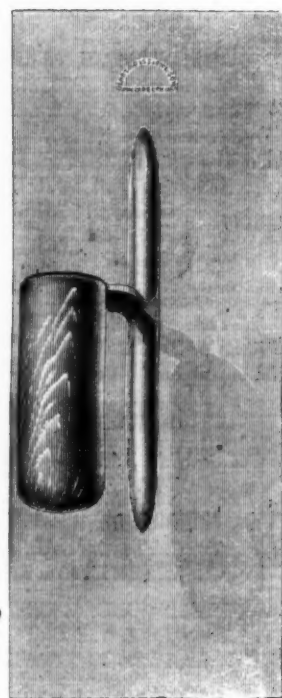


The Sampson Saw Set.

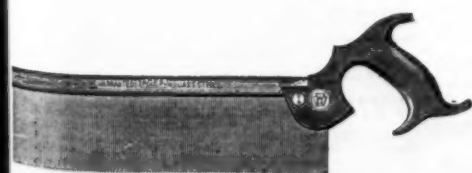
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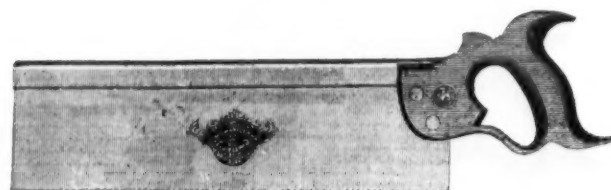
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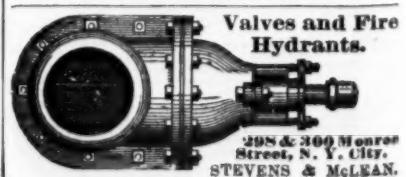


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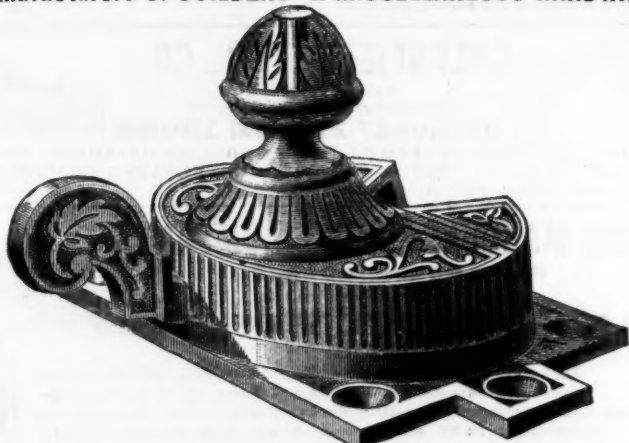
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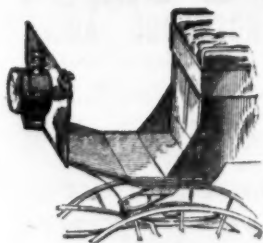
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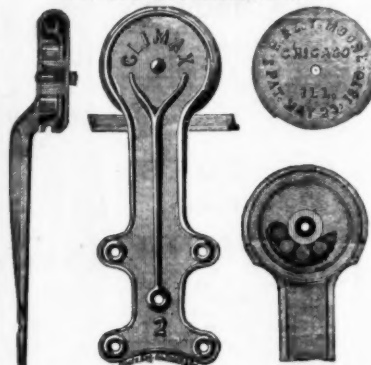
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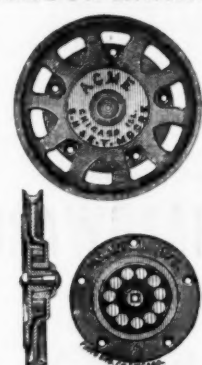


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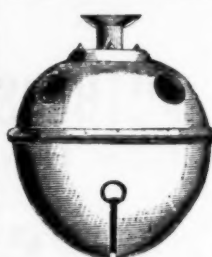
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All sizes constantly on hand for Rope from 1/4 in. to 3 1/2 in. diam., and for Chain 3-16 to 1/2 in. diam.



McCOY & CO., 134 & 135 Duane Street, NEW YORK.



Bemis & Call Hardware & Tool Co.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Jardened throughout, and not only combine all of the superior qualities of our cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench, thus making a Combination which has no equal. For Circulars and Price List, address,

BEMIS & CALL HARDWARE & TOOL CO. Springfield, Mass.

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets; Copper and Swedge Iron, Leathered, Carper, Lace and Glass Tacks; Finishing, Ironing, Trunk, Coat and Chest Box Nails, &c. Rivets made to Order.

NEW YORK AGENCY

Grundy & Kenworthy HARDWARE.

165 Greenwich Street.

Agent for the Philadelphia Star Carriage and Tire Bolts

Established in 1836.

Shelton Company,

Manufacturers of every variety of

TACKS & SMALL NAILS,

Carriage, Machine, Floor, Stove and Tire Bolts, Coach Screws, Bed Screws, &c.

BIRMINGHAM, CONN.

METALLIC SIEVES.



Protected by 14 patents.

SALES: 1871.....3,501 doz. 1872.....12,000 doz. 1873.....30,000 doz. 1874.....8,000 " 1875.....12,000

MANN'S PATENT.

Best Sieve known: Clean, Neat and Durable.
GEO. E. DAYTON, Manufacturer, Chicago.
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A.G. COES & CO.
PAT. DEC. 26, 1871.

Established in 1839.

A. G. COES & CO.

WORCESTER,

Mass.

Manufacturers of

THE GENUINE

COES'

SCREW WRENCHES.

Our goods have been very much improved recently, by making the Bar WIDE, as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using

A. G. COES'

NEW PATENT

FERRULE

Which cannot be forced back into the handle.

Our goods are manufactured under Patents dated February 7, 1860, (renewed June 23, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be vigorously prosecuted.

We call particular attention to our new Patent Ferrule, with its Supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

A. G. COES & CO.

MODEL

Scroll Saws,

(Best in the Market.)

Flower Pot Brackets,

Self-Acting Fountains,

AQUARIA, FILES, VISES,

And Specialties in

HOUSE FURNISHING GOODS.

Send for price lists.

G. WEBSTER PECK,

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General Assortment of

HARDWARE

For the Country Trade.

Romer's Padlocks,

WINSTED TOE CALKS,

D. E. FELTER & CO.'S ICE TOOLS,

A full line constantly on hand.

Lloyd, Supplee & Walton, HARDWARE FACTORS.

MANUFACTURERS OF

Bonney's Hollow AUGERS.

Stearn's Hollow Augers

and Saw Vises

Bonney's Spoke Trimmers

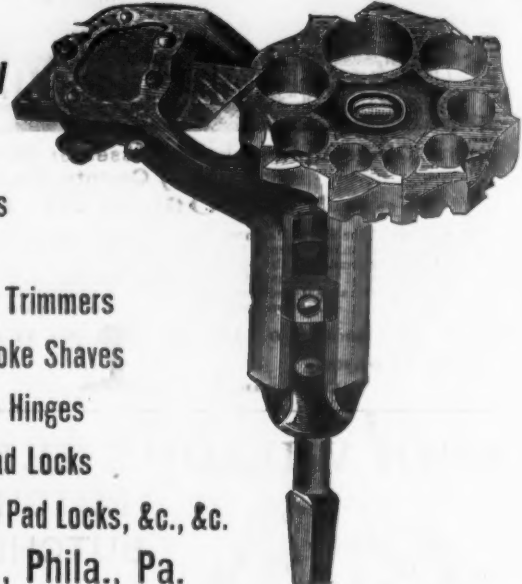
Double Edge Swoke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks

Flat Key Brass and Iron Pad Locks, &c., &c.

625 Market St., Phila., Pa.



The American Club Skate Still Ahead



After the severest tests for the past four years, these skates are now admitted to be the only practical SELF-ADJUSTING SKATES IN MARKET. The clamps are first adjusted to the shoe by turning the thumb-screw D when the lever C is in the above position. When once adjusted, place the skate on the foot, close the lever C, and the skate is securely fastened to the foot. By the action of the clamps, the skate is always in the center of the foot, and cannot slide from side to side as in other clamp skates. They require no heel plates, key or wrench.

PRICE LIST.

No. 1.—With Blued Footplate, and Runners the same as the best.....\$3 00
No. 2.—Same as No. 1, only nicely Nickel Plated, effectively prevents the skate from rusting..... 6 00
No. 3.—Same as No. 2, only before the skate is put together each part is finely Polished and heavily Nickel Plated, the finest skate ever offered..... 8 00

Sole Jobbing Agents for **WINSLOW'S WOOD TOP SKATES.**

Special trade catalogue sent on application. Address,

PECK & SNYDER, Manufacturers, 126 Nassau St., N. Y.

V. G. HUNDLEY.

79 Reade Street, New York. Agent for



North Carolina Handle Co., (WILSON & SHOBER, Proprietors.)

Manufacturers of **SPOKES, AXE, PICK, SLEDGE, HAMMER, HATCHET** and other handles. Full assortment always on hand.

GREENFIELD TOOL CO., Greenfield, Mass.

Sole Manufacturers of the Celebrated

"Diamond" PLANE IRONS

EXTRA PLATED TABLE CUTLERY. PATENT FORGED OX SHOES. The only Shoe made with concavity to fit hoof. BENCH AND MOULDING PLANES of every description, &c., &c. Drop Forgings to order. Address for Catalogue with stamp.

WILSON MANUFACTURING COMPANY,

NEW LONDON, CONN.

MANUFACTURERS OF

SOLID BOX VISES.

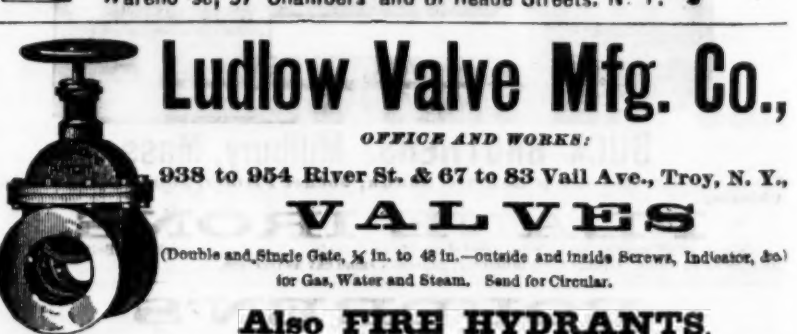
With or without Convex and Concave Washers.

Jackscrews, Braces, Coffee Mills, Turning Lathes, Clamp Heads and Screws; Parallel Bench Vises, Sash Pullies, Ho House Pulleys, Composition Cocks, Bench Screws, Vice Screws, Gridirons, Drill Stocks and Bows, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and General Hardware.

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WILSON MFG. COMPANY,

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Ludlow Valve Mfg. Co.,

OFFICE AND WORKS:

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VALVES

(Double and Single Gate, 1/4 in. to 48 in.—outside and inside Screws, Indicator, &c.) for Gas, Water and Steam. Send for Circular.

Also FIRE HYDRANTS.

MALTBY, CURTISS & CO.,

Manufacturers of METAL KEY MAPLE AND ROSEWOOD FAUCETS.

Also Manufacturers of

Capewell's Giant Nail Puller.

The Buell Peg Float

AND THE

Little Giant Tack Puller.

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PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Avilla—Solid Cast Steel.....	11 10
Peter Wright's, 3/4 in. gold.....	11 10
Whitcomb's.....	11 10
Engle.....	9 cents per lb.—dis 20
Apple Parers—Domestic.....	per doz \$ 9.50
Peach Parer.....	10 50
Bay State Parer. Corer and Slicer.....	13 50
Other makes.....	7 50
Lots of 5 to 25 dozen special price.	

Aces—	
Man (according to weights).....	Per doz \$10 50 to 9 00
Red Indian.....	10 50 to 10 00
Red Chertala.....	11 00 to 10 50
Crown Prince.....	11 00 to 10 50
Unit.....	12 50 to 11 50

Angers and Anger Bits—	
Benjamin Pierce.....	dis 35
Douglas & Ives' Bits.....	dis 40 to 4
Connecticut Vase Auger Bits.....	dis 40 to 4
Jennings' Bits.....	dis 40 to 4
Ward's Auger.....	dis 40 to 4
Douglas & Ives' Augers.....	dis 40 to 4
Natural Ship Augers.....	dis 40 to 4
Donner's Pat. Hollow Augers.....	dis 40 to 4
Secor's Patent Hollow Augers.....	dis 40 to 4

Balances—	
Light or "Common".....	dis 25 to 10
All other Sizing Balances.....	dis 25
Bells—	
Bellows—	
Common (Tissue Paper Weight).....	dis 70
Swiss Pattern.....	dis 50
Common Door Bell.....	dis 50 to 20
W. Western & Kentucky Cow.....	dis 50

Boring Machines—	
Bates Mfg. Co., com- plete with augers.....	dis 20 to 25
Douglas Mfg. Co., complete with augers.....	dis 20 to 25
Common Boring Machines, no Augers.....	dis 20 to 25
Auger.....	dis 50 to 4 75

Bells—	
Eastern Carriage Bells.....	dis 75
Western.....	dis 75
Philadelphia.....	dis 60 to 10
Wrought Sautter, Stanley.....	dis 60 to 10

Braces—	
Barber's.....	dis 40 to 5
Bartholomew's American Bell.....	dis 10 to 10
Bartholomew's.....	dis 50

Bats—	
Cast Fast Joint, Narrow.....	dis 25 to 10
Broad.....	dis 35 to 10
Cast Fast Loose Joint.....	dis 45 to 10
Acorn, Loose.....	dis 45 to 10
Mayers & Parliament.....	dis 45 to 10
Acorn Jap'd.....	dis 45 to 10
Wrought Loose.....	dis 45 to 10

Table Hinges and Back Flaps.....	dis 45 to 5
Narrow.....	dis 45 to 5
Loose Joint Chain.....	dis 45 to 5
Parker's Blind Nut.....	dis 45 to 5
Butterfly Bolt.....	dis 45 to 5
Clark's.....	dis 45 to 5

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Casters—	
Iron and Steel.....	dis 45 to 10
Porcelain Wheel.....	dis 45 to 10
Iron and Steel.....	dis 45 to 10
Porcelain Wheel.....	dis 45 to 10

Clothes Wringers—	
Universal.....	dis 75 to 10
Novelty.....	dis 75 to 10
Monitor.....	dis 75 to 10
Discount on 1 dozen lots.....	dis 75 to 10

Coffee Mills—	
Common and Side.....	dis 30
Patent Box and Side.....	dis 30
Cutlery—	
Fraser & Clark, J. Russell & Co., and Landon & Goodnow Mfg. Co. Manufacturers' net prices.....	dis 30 to 30 1/2

Drawing Knives—	
Hart Mfg. Co.....	dis 60
Adjustable Handle.....	dis 10 to 15
Fraser & Clark.....	dis 15 to 20

Fry Pans—	
Tinned.....	dis 40 to 45
No. 1.....	dis 40 to 45
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Lever, Oliver & Phillips, H. B. Newhall, H. Warren St. New York, Agent.

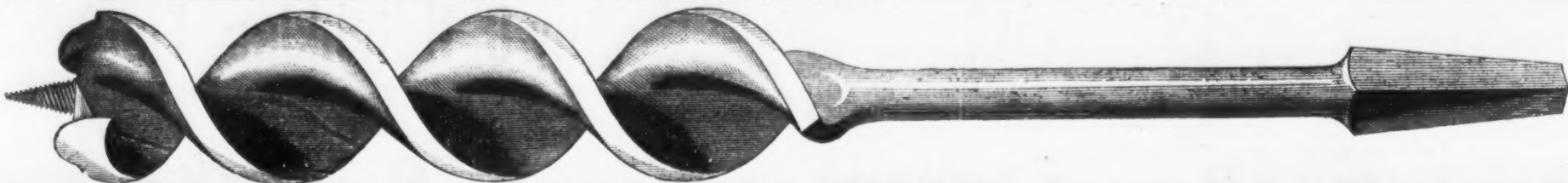
Iron, standard list assorted sizes, for large orders, special

discounts to include Bands, small Rounds and Ovals,

20c. rate, 2 1/2 off net.

Merchant Bar Iron, as per terms named above.

Flat (1 1/2 x 3/4), punched and counter sunk.....
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Discount off Standard List.....	
Carriage and Tire Bolts, 75c off net.	
Stove Bolts.....	50c off net
Elevated Bolt.....	50c off net
Machine and Square Head Bolts.....	50c off net
Coach and Lag Screws.....	50c off net
Bolt Washers.....	50c off net
Pat. Hot Pressed Sq. and Hex. Nuts.....	50c off net
Washers in lots less than one keg each size.....	50c off net
Nuts and Washers in 5 lb. boxes, 1c. 1/2 ex. net prices.	
Standard Caps, for Flange Bolts, 1c. 1/2 ex. net.	
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Kasson's Patent Concavo-Convex Twist AUGERS, Auger, Car & Machine Bits.

The front or working faces of these Augers and Bits are Concave, and the rear faces are Convex. This peculiar construction reduces friction in boring, prevents clogging, and enables the operator to do more work with less effort than with any other Auger or Bit now in use. They do not require to be withdrawn for clearance of chips while any part of the twist is outside the surface of the wood. Correspondence and orders solicited. These goods are *Solid Cast Steel*, and superior to any in the market. For sale to dealers at standard list, with usual discounts. Manufacturers supplied with machine Bits (spur lip for cross, or curved lip for end boring) of any length of twist required.

GRAHAM & HAINES, Sole Agents, 113 Chambers Street, N. Y.

MILWAUKEE MANUFACTURING CO., SOLE MANUFACTURERS, Milwaukee, WIS.

H. H. ROYD & CO.
WATERFORD.
NEW YORK.

H. HAMMOND
Manufacturer of
CAST STEEL HAMMERS
HARTFORD, CONN.

H. H. HARVEY'S HAMMER AND TOOL WORKS, Augusta, Me.

SPECIALTIES.—Stone Cutters' Hammers and Tools, Quarrymen's Drills, Wedges and Half Rounds, &c., &c., &c. Miners' Hammers and Tools, Blacksmiths' Hammers and Tools, Patent Hammers for picking burr stone. Also the common Mill Picks and Wood wedges Steel or Iron, H. R. Solid eye Picks, with one lb. of best Cast Steel inserted in each pick. The above goods are warranted superior to none, both in quality and style of finish. All hammers have true eyes and polished faces, and are made from solid cast steel. No charge is made for boxing or carting at Augusta; shipping facilities are excellent. Hammers made to any pattern or drawing. Capacity of works, one ton of hammers per day. A full line of the above goods constantly in stock. Catalogue on application.

Silver & Deming Mfg. Co.
SALEM, OHIO, U. S. A.,
Manufacturers of
Improved Feed Cutters
HORSE POWERS,
Meat Choppers & Meat Stuffers,
HUB BOXING MACHINES,
Spoke Tenoning Machines,
Hollow Augers, Adjustable Clamps.
WATER TUYERE IRONS,
Blacksmith Drills, Saw Gummers, &c.
Liberal discounts to the trade.
Send for price list.

THE
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Award and Special
Report
from Judges at the
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Central and South America,
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Improved Blacksmith Drill.

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Assorted sizes for Straight, Circular and Half Circle Printing. These letters **CHANGE** to form any **NAME, WORD or SENTENCE AT PLEASURE.** Millions retailed yearly for Bag Plates, &c., marking Robes, Show Cards, and 1000 uses.
SUPERIOR TO ALL OTHER STENCILS.
Also Ink and Brushes. Send Postal Card for Samples, new Price List and Illustrated Circular.
O. G. BRYANT, 102 Washington St., CHICAGO.
Owner of Patents in the United States and Canada, and exclusive Manufacturer.

NORTHWESTERN HORSE NAIL CO.
ESTABLISHED IN 1862.
HAMMERED AND FINISHED HORSE NAILS.
We offer our Finished Nail to the trade with the confidence that it has no equal in the market. It is the genuine "Northwestern" Nail, Finished, and we give it our unqualified guaranty.
Office and Factory, 56 to 68 Van Buren st., Chicago.
A. W. KINGSLAND, Secretary.

GLOBE NAIL COMPANY,
MANUFACTURERS OF
Pointed Polished & Finished Horse Shoe Nails.
Recommended by over 20,000 Horse Shoers.
All nails made from best NORWAY IRON, and warranted perfect and ready for driving. Orders filled promptly and at lowest rates by
GLOBE NAIL CO., Boston, Mass.

MOLDING MACHINE.

Prices Reduced.
T. F. HAMMER'S PATENT.
Beside all advantages Molding Machines possess over hand molding, it is especially adapted for this machine that
It requires no special flasks or boards but the same are used as for hand molding.
It occupies no more room than a bench for hand molding.
It produces at less cost more, smoother and uniform castings.
Price List on application.
T. F. HAMMER,
SOLE MANUFACTURER,
Branford, Conn.
Malleable Iron Castings made to order.

BLISS & WILLIAMS,
Manufacturers of all kinds of
PRESSES, DIES, & SPECIAL MACHINES.
FOR WORKING SHEET METALS, &c.
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Manufacturers and Importers of
GLUE
261 Pearl Street,
New York City.

BRADLEY'S Cushioned Helve Hammer
Has Won Golden Opinions from the Mechanical World during the four years it has been before the public, and has reached a sale of 200 Hammers, all in successful operation, in this and foreign countries.
It Has More Good Points, Less Complication, More Adaptability, Larger Capacity, Does More and Better Work, Takes Less Power, Costs less for Repairs than any Hammer in the World. **GUARANTEED AS REPRESENTED,** and "DON'T YOU FORGET IT."
Established 1832.
BRADLEY MFG. CO., Syracuse, N. Y.
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RICHARD DUDGEON,
No. 24 Columbia Street, New York,
MAKER AND PATENTER OF
Hydraulic Jacks and Punches,
ROLLER TUBE EXPANDERS
And Direct-Acting Steam Hammers.
Communications by letter will receive prompt attention.
JACKS for Pressing on Car Wheels or CRANK PINS made to order

HYDRAULIC JACKS

AND
PUNCHES
For
Raising Heavy Weights,
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HYDRAULIC PRESSES
On hand and made to order.
Send Hand Hydraulic Presses
Bought and Sold.
Machinery for Polishing and
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E. LYON, 470 Grand St., N. Y.

HOLSKE MACHINE CO.,
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For Hotels & Stores a specialty.
Machinery in General made to order.

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Manufacturers of
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ESTABLISHED
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1842
Patented" Furnace Charging Scale.
Double Beam R. R. Truck Scale, Com-
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First Power Locomotive Scales. Testing
Machines and capacity.
Send for Illustrated Price List.

BUFFALO
Bellows Factory and
Planing Mill.
ESTABLISHED 1852.

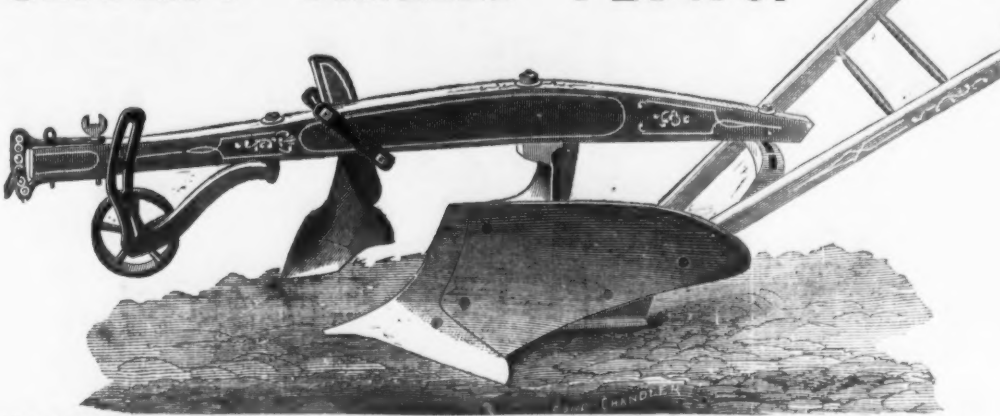
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Contractor, Builder
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CLINTON, cor. ADAMS STS.,
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SASH, BLINDS DOORS,
Cisterns, Tanks, Stairs, Hand Rails, Newels, Mirror
Frames, Mantels, Curtain Cornices, Book Cases,
Veneered Doors, Mouldings, and complete interior
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ROUGH AND PLANED LUMBER,
Flooring, Siding, Shingles, Lath and Fence Posts.

Blacksmiths' & Moulders' Bellows.
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GEO. M. SCOTT
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BELLOWS
JOHNSON ST.
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OLIVER'S CHILLED PLOWS.



These implements, though but four years before the public in their present form, show the following remarkable record:

Year	1871	1872	1873	1874
1871	15,000	7,472	31,077	42,139
1872	3,049	14,976		

The sales for 1876, will undoubtedly exceed 60,000 Plows. For full descriptive circulars, address,

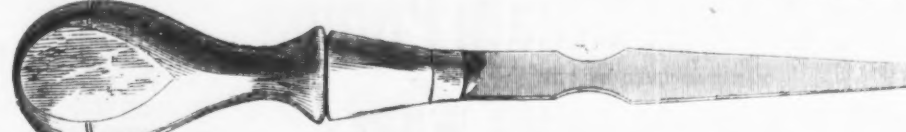
SOUTH BEND IRON WORKS, South Bend, Ind.

THE COWLES HARDWARE COMPANY, Unionville, Conn.,
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Screws Drivers of all varieties, Box Scrapers, Box Openers, Garden Hoes, Garden Trowels, Border Knives, Mincing Knives, Fish Tanners, Butter Knives, Cake Turners, Cleavers, Hammers, Carpet Stretchers, Tack Claws, Marking Awls, Carpenters' Awls, Belt Awns, Ice Awns, Carriage Jacks, Nail Sets, Bush Holes, Ice Axes, Ice Longs, Parent Mouse Traps, Vegetable Slicers, Bit Braces, Butts and Spiral Springs, Ferrules, Ham Trays, Ham Stringers, Oyster Knives, Cold Chisels, Handies, Solid and Prick Patches, Box Hooks, Bow Pins, Bull Ring Needles, Bull Rings, Bull Hooks, Blind Adjusters, Curving Irons (Wrought), Cork Screws, Cattle Leadors, Corn Hooks, Door Springs, Knives (Kitchen), Saw Sets (Hart's Patent), Saw Sets (Improved Bench), Spoon Table and Teas, Washers (Tin and Iron), Kach Rings a specialty, and IMPLEMENT SCREW DRIVERS. Catalogues and Circulars sent on application.

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Made of JESSOP'S BEST CAST STEEL, and warranted superior to any other.
Two sizes: Large Size Boring, $\frac{1}{4}$ to 3 inches; Small Size Boring, $\frac{1}{8}$ to $1\frac{1}{2}$ inches.



WILLIAM A. CLARK, Westville, Conn.

SAMSON WRENCH

RECEIVED THE
CENTENNIAL MEDAL AND DIPLOMA OF MERIT.



It is the only positive Wrench that will hold Gas or Steam Pipe, Gas Burners, Round Iron or Steel without slipping. Samples sent to the trade only, on receipt of fifty cents and business card.

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(PATENT APPLIED FOR.)

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CROSBY GILZINGER & CO., Manufacturers RONDOUT N. Y.
GOLD MEDAL

Non-Extensible Razor Belt.

PATENTED JULY 25, 1871.

RE-ISSUED MAY 13, 1873, and JUNE 9, 1874.

In this Strap the liability of the leather to stretch and become loose and porous is prevented by the use of a patented non-extensible base, which supports the leather and secures

PERMANENT ELASTICITY.

We make this style with single rod, double rod, and wood frames, and intend that it shall, in quality compare favorably with our other well known brands.

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Capacities from 1 to 100 tons.

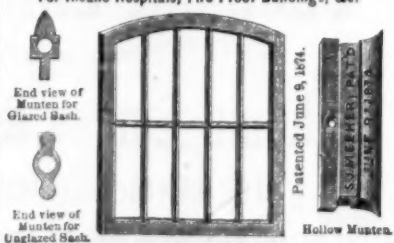
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For Insane Hospitals, Fire Proof Buildings, &c.



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I. C. 12x12 Charcoal.....	13.50
I. C. 12x12 Charcoal.....	14.50
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I. C. 12x12 Charcoal.....	98.50
I. C. 12x12 Charcoal.....	99.50
I. C. 12x12 Charcoal.....	100.50

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Angers.—Blue Jacket.....	dis 10c
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Angers.—Handled, B. (No. 98).....	dis 10c
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Wheeler, Madsen & Clemons.....	\$3 to \$2	\$1.75
Shower's Tapers, genuine, 3 in., 1 in. 50; 3 in., 1 in. 75.....	\$1.75	\$1.75
Funnel Rinsers	dis 10c	
.....	\$2.50	\$2.50
Deep Flange.....\$9.50	5 in. 100	\$2.50 per foot 7 in.
Hammers	5 in. 50	dis 10c
M. B. & D. solid cast steel.....	5 in. 100	\$10; 15 in. 250
.....	5 in. 50	bell face, 10c
Hammond.....	1 1/2 in. 49.75	
Langers & Rollers	Anti-Friction.....	dis 60c
Climate.....		dis 40c
Acme.....		dis 40c
Harbets	Underhill Engine Tool Co.....	dis 25c
C. F. Dowse, warranted Cast Steel.....		dis 25c
.....	5 in. 47.75	1 1/2 in. 25.75
Claw.....		5 in. 25.75
Lathing.....		dis 50c
Axe Pattern.....		\$7.00
.....	5 in. 25.75	1 1/2 in. 25.75
5 in. 25.75	1 1/2 in. 25.75	1 1/2 in. 25.75
Hinges	Strap and T. Stanley Works.....	dis 60c
.....	Joint.....	dis 60c
Wrought Steel Hook.....		dis 50c
Koons	Imp. Extension Silvered Glass.....	dis 60c
.....	Imp. Extension Silvered Glass.....	dis 60c
burners No. 74, (with kerosene oil and candle)		dis 50c
Lead	Sheet.....	dis 50c
Locks	Norwalk Lock Co.....	dis 50c
Mattresses		
K. F. & Co. extra. long outer.....		\$11.50—60 in.
Ment Cutters	"Miles" Challenge.....	dis 10c
No. 1, \$2.00; No. 2, \$3.00.....		
Nails	and larger, 25c; 3 in. 50; 3 in. 50; 3 in. 50.....	dis 10c
Nail Pullers	Little Giant Small.....	per doz. 25c
Padlocks	Waco.....	dis 50c
Picks.....	H. F. & Co. Solid Eyes.....	\$3 to \$10
Planes	Universal Hand cut all wood.....	\$1.50
2 in. 100; 3 in. 100; 3 in. 100; 3 in. 100.....		\$1.50
Planes	Abnurn Tool Co.....	dis 40c
Plated Ware	Hogers Bros.....	dis 40c
Pocket knives	Conn. Cutlery Co.....	dis 40c
Plumb & Levels	Stanley.....	dis 60c
Potato Diggers		
Wilmington & Co.....		dis 35c
Pullers	Axle.....	
Frame Pull. Wheel.....	No. 15, 16 in. 25c; 16 in. 25c.....	dis 40c
.....	No. 18, 18 in. 25c; 18 in. 25c.....	dis 40c
.....	No. 21, 21 in. 25c; 21 in. 25c.....	dis 40c
.....	Malibu Pat. Axle Bronze Face.....	16 in. 25c; 2 in. 25c
.....	Cast Steel Axle.....	16 in. 25c; 2 in. 25c
Rail Barn Door	For Novelty and Anti-Fric-	dis 40c
tion Hangers.....		per foot 10c
Rivets	Black.....	dis 50c
Rivets	Black.....	dis 50c

THE JUDSON GOVERNOR.

It is a common method to advertise Governor, *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacks durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

Reduced Price List,

JANUARY 25th, 1876.

For dimensions of Governor, see Illustrated Price List.



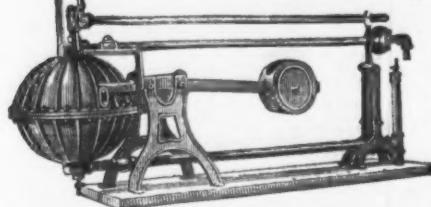
THE JUDSON PATENT Improved Steam Governor.

Size, Inch.	Plain.	Bright (Inch.)	Extra (Inch.)	Stop Valve.
1	\$17.00	\$19.00	\$1.00	..
1 1/2	21.00	24.00	2.00	\$5.00
2	25.00	28.00	3.00	6.00
2 1/2	29.00	33.00	3.50	8.00
3	35.00	40.00	4.00	10.00
3 1/2	42.00	48.00	4.50	14.00
4	45.00	51.00	5.00	15.00
4 1/2	49.00	56.00	5.50	17.00
5	55.00	63.00	6.00	20.00
5 1/2	64.00	73.00	7.00	25.00
6	74.00	84.00	8.00	30.00
6 1/2	86.00	97.00	9.00	36.00
7	94.00	106.00	10.00	42.00
7 1/2	119.00	135.00	11.00	48.00
8	125.00	138.00	12.00	54.00
8 1/2	150.00	165.00	13.00	68.00
9	185.00	202.00	14.00	80.00
10	205.00	225.00	15.00	..

No Charge for Boxings & Cartage.

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The Albany Steam Trap.



This Trap automatically drains the water of condensation from *Heating Coils*, and returns the same to the Boiler *whether the Coils are above or below the water level in Boiler*, thus doing away with pumps and other mechanical devices for such purposes. Apply to

Albany Steam Trap Company, Albany, N. Y.

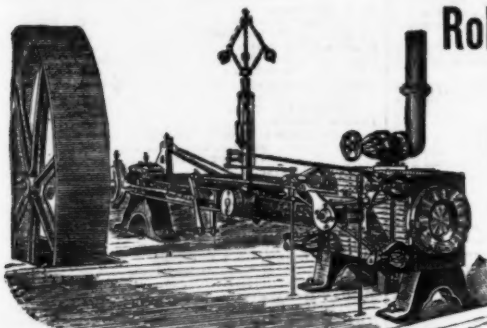
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Have constantly on hand and making

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There has long been a want of some device by which the straightening of shafting could be done without removing the work from the centers, and at the same time do it quickly and accurately. The

SCOFIELD PATENT SHAFT STRAIGHTENER

meets just such a want: the apparatus is light and can be easily handled, yet it is of sufficient strength for the purpose required. It can be placed upon the shears of the lathe, and moved along the entire length of the work. It is especially

Adapted to Removing Short Bends,

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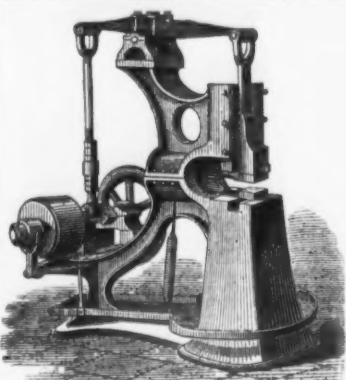
New Pattern with Important Improvements & Abundant Strength



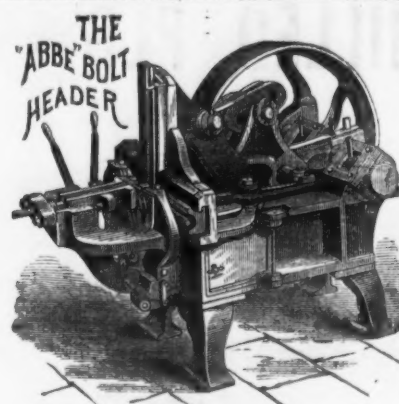
For reducing to fragments all kinds of hard and brittle substances, such as STONE for making the most perfect MACADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS. It is extensively in use in MINING operations, for crushing

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Of these Machines we are building sizes to meet the requirements of all Manufacturers and Workers of Iron and Steel. In simplicity, durability, ease of operation, accuracy, and range of work, we guarantee them superior to any Machines of their kind produced in the world. For prices, references, and full descriptive circulars, address

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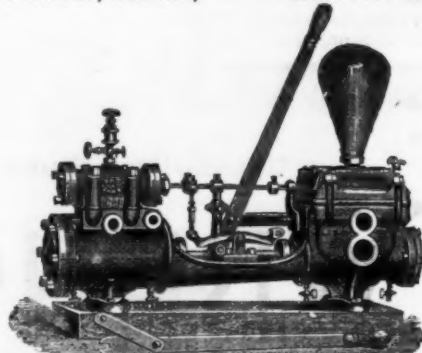
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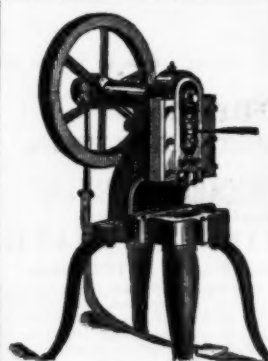
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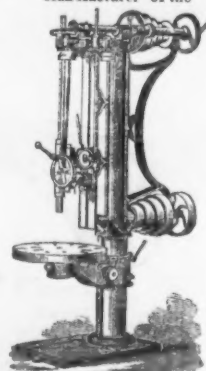
Office, 228 Market Street,

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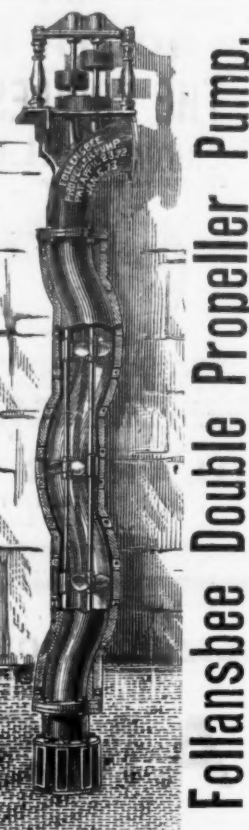
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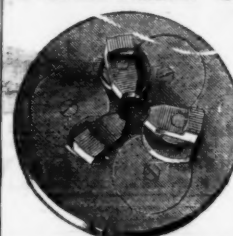
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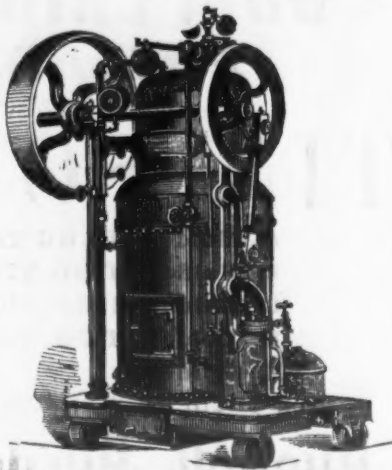
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\$200.00.Cheaper than any Engine offered of
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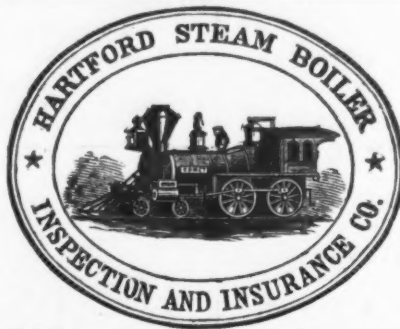
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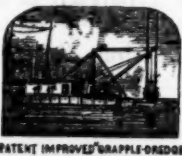
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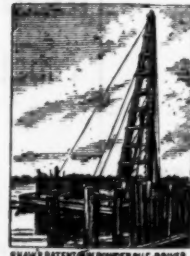
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Anti-friction and noiseless; maximum blast and minimum power;
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KEYSTONE EXHAUST BLOWERS.

Made on same principle,

For Ventilating Mines, Buildings, etc.; Removing Dust,
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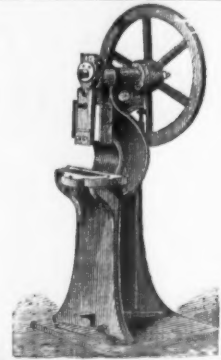
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REPORT OF JUDGES

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Exhibition of theAMERICAN INSTITUTE,
Held in the City of New York, Oct., 1875No. 318, Drawing, Drop &
Punching Presses.THE STILES & PARKER PRESS CO.,
Of Middletown, Conn.

The machinery exhibited by these makers is of a
character that calls for special commendation. In
addition to their well known punching presses, to
which a new feature has been added in a press ad-
justable to an inclination for discharging work left
above the die, there are exhibited by them a com-
bined punch and shears, a drawing or blanking press,
and a drop.

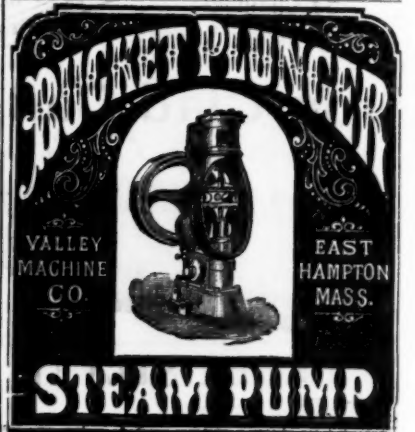
In all these there is shown the highest mechanical
culture, applied to meet every practical requirement,
to avoid every practical difficulty, and to enlarge the
range of application of the machines, by device
which are at once simple, elegant, and effective.

Your committee would unhesitatingly recommend
for this exhibition the "Medal of Progress" but
find such award barred by the rule of the Institute,
forbidding such award unless a Silver Medal has
been previously awarded. We, therefore, respect-
fully recommend the award of a Silver Medal.

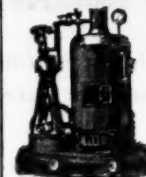
Silver Medal Awarded.

A true copy from the Report on file.

JOHN W. CHAMBERS, Sec'y.

AQUOMETER
Steam Pump.Highest Premium awarded by
Franklin Institute, 1874.For Simplicity, Economy of
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EUREKA SAFETY POWER!



Practically impossible to
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pressure per square inch. With
slit 1/2 inch seasoned oak—grinds
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FRICTION PULLEYS

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XXX Genuine.....	40c	C.....	90c
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X.....	35c	E.....	18c
A.....	30c	F.....	11c

Note.—The above are my standard mixtures, and have given satisfaction wherever used, but I am prepared to make Anti-Friction Metal of any quality or mixture desired by the purchaser.

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Elliptic, Platform AND C Springs,

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CAST SPRING AND PLOW STEEL.
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NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.**JOHN RUSSELL CUTLERY CO.,**

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